

THE AUTOMOBILE



First of Shows
Central Palace

December 31st
to January 7th

What the I. C. M. A. Offers

Motor and Accessory
Manufacturers



Importers'
Automobile Salon



THREE HUNDRED makers of automobiles and accessories allied thereto are represented in the Grand Central Palace on Lexington avenue, where the American Motor Car Manufacturers' Association is holding forth in exhibition in conjunction with the Motor and Accessory Manufacturers and the Importers' Automobile Salon. A few unattached help to fill the odd spaces.

'Tis a most impressive showing by an industry which a fortnight hence will utilize another building for another show in order to complete the evidence of its amazing and substantial growth.

This afternoon the elect had a "private view" of the "Ninth International Automobile Show"—so-called this year because of the presence of the importers, who, by their diminishing numbers, are illustrating the old saying about the "survival of the fittest." Very few of those invited could have declined, for the rejuvenated and beautified old Palace had an enormous throng soon after the doors were open. This denoted undisguised interest.

But to-night the crowd came, and when President McGowan, of the Board of Aldermen, officially opened the exhibition, the aisles were becoming congested, and later the building probably held the largest crowd in its history. It is expected that a hundred thousand people will have passed through the turnstiles before the show closes, a week from to-night.

When it is said that the lowest priced car is sold at \$150, even though it be for the rising generation, and the highest priced vehicle is listed at \$15,000, with the greatest variety of selection in between, it is apparent that this show should meet the wants of any class of buyers, even the most exacting.

The car exhibits are subdivided into 67 American, 14 foreign and 12 commercial, supplemented by 220 spaces occupied by accessory manufacturers.

Over 2,000 carriage dealers have received special invitations to attend, and a goodly number of them are already examining the automobile field, realizing that their own domain is gradually succumbing to the inevitable invasion of motor-driven vehicles.

Of course, there will be dealers from all over the country, and the National Retail Automobile Dealers' Association has headquarters in the Palace.

From cellar to roof the Palace was converted to the needs of an automobile show, and many difficulties were successfully met with in the thorough work that progressed with surprising rapidity. According to the story of the press representative, \$30,000 have been expended in the decorations, which this time include the porte cochere and outside of the building. Jean Paleogue, well known in connection with automobile show art, has supplied some huge paintings which assist harmoniously in the interior embellishment, the racing scene possibly attracting the greatest amount of attention, for the public is ever fascinated by a scene of speed such as can be supplied by the modern distance chariots.

Naturally included in the cars exhibited are the Savannah big and little Grand Prize winners—the Fiat of Wagner and the Lancia of Hilliard. The cups are also

displayed with undisguised pride by the possessing firms.

The decorative scheme is of an early English period, including statues of heroic size, some 9,000 incandescent lights, several searchlights and bevel-glass mirrors. Never before has the Palace been flooded with such a burst of electric brilliancy, and the result makes it appear strange and decidedly pleasing.

"Good art always costs money," said H. O. Smith, chairman of the show committee, previous to its opening, "and the best in the line of statuary, paintings and electrical equipment will be seen at the show in the Palace on the eve of the new year." What the chairman of the show committee said has been made good, and that the work has been in progress for several months can scarcely be doubted. The results tell a story without words.

Manager Reeves boasts of a most artistic office, fitted with Turkish draperies and it incidentally contains a cozy corner. L. M. Bradley, the assistant to the big little energetic man, has an office deluged in blue, while the press-

room, several times the size of the former one, has red and white panels with a blue cornice, thus accentuating the national idea in colors. All around, the Palace has received the best dressing up that ever came to it through any one of the various exhibitions that have been housed in it since it bid for show favor.

It would appear from the opening attendance that the day of the automobile show in this country is some distance away, especially in the metropolis, whither there come from all over many thousands who consider it a treat to find the leading cars of the industry under one roof ready to be inspected and explained and purchased. Possibly shows may become unnecessary in many cities, but the value of exhibitions in New York City and Chicago, and possibly in Boston, is likely to continue of such worth that the

manufacturers will hesitate and consider most carefully before deciding that the history of shows has been written.

Special nights are to be a part of the present show, the schedule calling for a Municipal night, a Merchant's night, an Engineers' night and a Military night. "Society" is to be specially catered to on Tuesday night next, and while its members have always had a predilection for the foreign car, the progress of the American maker has brought about serious inroads into the business of the importer. But a certain percentage of "Society" seems to be firm in foreign car liking, and undoubtedly will continue so to the end of the chapter.

The military orchestra of Fred W. Bent is supplying the music, and this includes an "International March," a two-step called "Around the Jericho Turnpike" and a gallop named "The Last Lap," with a waltz christened "The 1909 Model." The substitution of an orchestra in place of a noisy band seems to be one of the many excellent features embodied in this decidedly creditable exhibition arranged by the hard-working committee of the A.M.C.M.A., which has demonstrated that the makers did not need assistance from any other source whatever in order to insure what is certain to be a most successful week. Nowadays the public asks first to be pleased.



The Men Who Run The Show

ALFRED REEVES

thus interestingly tells how the "show" is made ready and run:

More than eight months of work, the time, attention and labor of some 4,000 men and the expenditure of thousands of dollars is required for the putting on of an automobile show like the Ninth International affair which opens in Grand Central Palace, New York, on New Year's Eve. Prior to the show some 400 workers devote all their time to the preparations, while during the affair not less than 200 employees are at their posts day and evening in the general caring for the public and exhibitors. Added to this are some 3,400 manufacturers and their employees on hand showing the very latest in the motoring world both as to American and foreign cars and accessories, including the captains of industry, the sales managers, salesmen, chauffeurs, demonstrators and those of other callings.

The art work required to properly stage the glittering, power-driven machines of modern life will cost something like \$30,000 for the single week, being expended on decorations, electric lights, paintings, statues and the other features of the big exposition. Excepting the electrical equipment, all of this is practically useless after the show. It is all made possible by the tremendous and increasing interest in motoring and the motor car, evidenced best by the record-breaking attendance that always favors these affairs and which results in the valuable business returns to those showing their products.

As in former years, every inch of available room has been taken, there being something like 70,000 square feet of space allotted to exhibitors at the coming show, with a dozen or more firms on the waiting list. Added to all this is the record-breaking attendance of agents which is assured for this affair, a major portion of the 3,000 motor car agents and 2,200 leading carriage dealers of America being certain to view the 1909 offerings of the automobile tradesmen. As for the attendance of the general public, it is predicted that not less than 100,000 people will visit the Palace from the opening on New Year's Eve to the closing of the show on January 7.

There is really no great secret about the handling of a motor car show. It is the same old story of perfect organization, made a bit more difficult by the fact that plans for these affairs are somewhat of a temporary sort, hastily devised

and the men trained quickly for their work, somewhat like artists are trained for a big stage production which has only a short time for rehearsals.

A clean-cut system must be in vogue for some

months prior to the show to handle the preliminaries, and a most exacting one to look after the comfort of the exhibitors and visitors during the progress of the affair. Some nine months ago the first plans for the Ninth International Exposition in Grand Central Palace were laid, when Benjamin Briscoe, chairman of the American Motor Car Manufacturers' Association, appointed the show committee. The men selected as directors of the affair were H. O. Smith, chairman; R. M. Owen and S. H. Mora, with the addition of E. R. Hollander, representing the Importers' Automobile Salon, and D. J. Post, of the Motor and Accessory.

After surveying the Palace, diagrams were issued, contract and space applications prepared and the whole distributed throughout the automobile trade. This was followed by the plans for advertising, an essential part of an exhibition depending upon public support. Poster designs were submitted, the approved ones were printed and arrangements made for their distribution on bill boards within 50 miles of New York City Hall, many of the posters being illuminated by electric lights. Then followed the advertising in the daily newspapers and the automobile papers, running into many thousands of dollars, and the handling of the publicity end which supplies the news regarding the show plans.

Most important of all contracts made was the one for decorations, which in this case went to the S. R. Ball Company of New York, whose design was considered the most original and best adapted to the Palace and to motor cars.

The printing of thousands of pieces of stationery of all sorts, the arrangements for the shipping to New York of the products of 300 automobile and accessory factories and the printing of some 200,000 tickets of all styles came in for consideration.

Following the applications for space and the drawing and the signing of contracts, the matter of plans for the care of agents during the show had to be given consideration, together with the annual show luncheon and the meetings that are always on schedule during show week.



BENJAMIN BRISCOE-CHAIRMAN AMCA



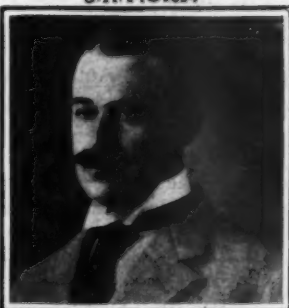
ALFRED REEVES-GENL. MANAGER



R. M. OWEN



S. H. MORA



E. R. HOLLANDER-IMPORTERS' DIV.



DAVID J. POST-M. & A. M.



H. O. SMITH-CHAIRMAN SHOW COM.



Some time prior to the show the regular departments for handling the affair were organized with a head to each, the whole being in charge of the general manager under the guidance of the show committee.

As the show must open on time, everything must be scheduled and carried out without delays of any moment. Four or five days before the show opens the Palace is turned over to an army of workmen who proceed to transform it in a manner that is astonishing to the layman. Included in this vast corp of help are carpenters, carpet layers, artists, drapers, sculptors, plaster workers, modelers, telephone operators, linemen, wiremen, furniture makers, brass workers, scene painters, ironworkers, telegraph operators, sign painters, freight handlers, shipping clerks, laborers, ushers, ground glass workers, floor polishers, silk hangers, banner makers and woodworkers.

For three or four days and nights the Palace is turned into a veritable beehive of industry, and to the layman it looks as though the show could never be ready on time. Order comes out of chaos, however, when the whistle blows for the opening for the private view, the cleaners quickly dispose of the debris and the public marches through the aisles with comparatively little knowledge of the accomplishments required to provide them with an exhibition of their favorite machines.

After the doors open the Palace becomes a city in itself, with a small army of employees who look after the public and exhibitors. The information bureau where out-of-town visitors and others ask for information, requires veritable human encyclopedias to supply. A complete telephone exchange is installed and begins work, wires going to almost every one of the 300 exhibitors, whose names are printed in a special telephone directory. Telegraph and telephone booths are opened up and thousands of pieces of mail matter are received daily. There is a day and night force of special police in uniform as well as

plain clothes men, to keep the Palace clear of questionable characters. Then there are ticket sellers, ticket takers, counters, pages, watchers, demonstration chiefs and helpers, laborers, porters, electricians, program boys, cleaners, two chefs, waiters and watchmen. The band of 25 pieces under Professor Bent, plays pleasing music and the English Inn is ready to supply food and refreshments to the multitude.

The executive officers of the show, with its cashiers, bookkeepers, stenographers, department clerks and office boys, work religiously for the comfort of the exhibitors. The press department opens its doors, and almost 400 newspaper men from all quarters of the globe are on hand to write of the great exposition, sending their stories to the prominent daily, weekly and monthly publications of this country and Europe.

Sign painters, decorators and electricians are kept in attendance for the use of exhibitors who arrive late. The various parlors and lounging rooms are alive with maids and attendants, and the building is patrolled by firemen and special deputies to prevent smoking and maintain order.

The flashing lights, searchlights, the 9,000 pearl incandescent lamps, the low murmur of voices, the music of the stringed orchestra and the display of the glittering, life-like machines all supply a picturesque scene that has few equals from a spectacular point of view.

After a week that is strenuous for everyone identified with the show in any way, the band plays "Home Sweet Home," the cars shipped to new owners or to other shows, tons and tons of accessories are removed, the beautiful decorations are demolished and within twenty-four hours the exhibitors have scattered all over the country. Once again the big Palace is quiet and a big motoring public has seen the best automobiles of America and of Europe with their accessories in a setting that is commensurate with motoring as a sport, as a pastime and as an industry.

CONCERNING THE GROWTH OF AUTOMOBILE SHOWS

By H. O. SMITH, CHAIRMAN A. M. C. M. A. SHOW COMMITTEE.

NO better illustration can be cited to demonstrate the magnitude of the industry than the wonderful growth of automobile shows since their inception November 3-10, 1900, when the Automobile Club of America launched the first exhibition in Madison Square Garden. To the A. C. A. belongs the credit of fathering automobile exhibitions in this country. Little did this young automobile club realize what a huge oak their little show acorn would develop into.

That infant exhibition of but 69 exhibitors created in the automobile buying public the first desire to become a motorist. The public knew little then of automobiles, and had a varying faith in the "horseless carriage." The vehicles were crude affairs, propelled principally by steam and electricity.

The rapid development of the A. C. A.'s shows is now history, and only a glimpse at the number of exhibitors of past shows and the present one in the Grand Central Palace, under management of the American Motor Car Manufacturers' Association, with their exhibit list totaling 286, is needed to demonstrate the growing popularity of the automobile.

On December 2, 1901, the A. C. A. opened its second show with 92 exhibitors. There was no show in 1902, but each year since has seen successful exhibitions with the following schedule:

1903—Jan. 17-24.....	Madison Square Garden—198 Exhibitors.
1904—Jan. 16-23.....	Madison Square Garden—205 "
1905—Jan. 14-21.....	Madison Square Garden—247 "
1906—Jan. 13-20.....	69th Regiment Armory—218 "
1906—Dec. 1-8.....	Grand Central Palace—216 "
1907—Oct. 24-31.....	Grand Central Palace—257 "
1908—9—Dec. 31—Jan. 7.....	Grand Central Palace—286 "

Not only has the number of exhibitors increased from 69 to 286, but the attendance has been tremendous, which means that automobile shows are a necessity, and a great business-getting proposition for the exhibitors.

The manufacturers who exhibit meet practically every live

dealer who go to the shows from the most remote parts of the country. Dealers meet the buying public, make new acquaintances and secure the names and addresses of those who are really interested and intend to purchase. All this can be accomplished in no other way at so small a cost.

Automobile shows have been the direct cause of changing many carriage dealers to the ranks of automobile distributors. Carriage dealers of every country are seeing the handwriting on the wall and the inevitable downfall of the horse. During the past season there has been a scramble among carriage dealers for an automobile agency.

Automobile shows are increasing in popularity and have become a fixture. The manufacturer, the dealer and the public all unite in the belief that automobile shows are imperative and should be continued. The automobile show has become such an important factor that it ranks with theaters in appealing to the masses. It has pushed the Horse Show into second position from a society standpoint, as is amply demonstrated by the reduction in demand and prices for Horse Show boxes at the recent horse exhibition in New York.

At no time in the history of automobile shows has there been so great a demand for space as this year at the Grand Central Palace show. If automobile shows did not well repay exhibitors, certainly there would not be such a demand for space.

At no time in the history of the automobile, has there been so much interest manifested in the annual show as this year. It has been fifteen months since the public have had an opportunity to attend an automobile exhibition and the attendance will unquestionably be tremendous.

That the automobile show in the Palace has become an important society event in New York is amply demonstrated by the fact that hotels and cafés have decorated for the occasion.

EXHIBITORS OF THE PALACE SHOW.

AMERICAN PLEASURE VEHICLES.

ACME—Acme Motor Car Co., Reading, Pa.
 AMERICAN—American Motor Car Co., Indianapolis, Ind.
 ALLEN-KINGSTON—Allen-Kingston Motor Car Co., Kingston, N.Y.
 AMERICAN SIMPLEX—Simplex Motor Car Co., Mishawaka, Ind.
 ANDERSON—Anderson Carriage Co., Anderson, Ind.
 ATLAS—Atlas Motor Car Company, Springfield, Mass.
 AUSTIN—Austin Automobile Co., Grand Rapids, Mich.
 BENNER—Benner Motor Car Co., New York City.
 BRUSH—Brush Runabout Co., Detroit, Mich.
 CAMERON—Cameron Car Co., Beverly, Mass.
 CARTERCAR—Motorcar Co., Pontiac, Mich.
 CHADWICK—Chadwick Engineering Works, Pottstown, Pa.
 COATES—Coates-Goshen Automobile Co., Goshen, N. Y.
 CRAWFORD—Crawford Automobile Co., Hagerstown, Md.
 DE LUXE—De Luxe Motor Car Co., Detroit, Mich.
 FORD—Ford Motor Co., Detroit, Mich.
 GAETH—Gaeth Automobile Co., Cleveland, O.
 GYROSCOPE—Gyroscope Automobile Co., 231 W. 54th St., New York.
 INTER-STATE—Inter-State Automobile Co., Muncie, Ind.
 JACKSON—Jackson Automobile Co., Jackson, Mich.
 KISSELKAR—Kissel Motor Car Co., Hartford, Wis.
 LAMBERT—Buckeye Mfg. Co., Anderson, Ind.
 LANE—Lane Motor Vehicle Co., Poughkeepsie, N. Y.
 MARION—Marion Motor Car Co., Indianapolis, Ind.

MARMON—Nordyke & Marmon Co., Indianapolis, Ind.
 MAXWELL—Maxwell-Briscoe Motor Co., Tarrytown, N. Y.
 MIDDLEBY—Middleby Automobile Co., Reading, Pa.
 MIDLAND—Midland Motor Co., Moline, Ill.
 MITCHELL—Mitchell Motor Car Co., Racine, Wis.
 MOLINE—Moline Automobile Co., East Moline, Ill.
 MOON—Moon Motor Car Co., St. Louis, Mo.
 MORA—Mora Motor Car Co., Newark, N. Y.
 McCUE—McCue Co., Hartford, Conn.
 NATIONAL—National Motor Vehicle Co., Indianapolis, Ind.
 OAKLAND—Oakland Motor Car Co., Pontiac, Mich.
 OMAR—Omar Motor Co., Newark, N. Y.
 OVERLAND—Overland Automobile Co., Indianapolis, Ind.
 PENNSYLVANIA—Pennsylvania Auto-Motor Co., Bryn Mawr, Pa.
 PREMIER—R. M. Owen & Co., 1759 Broadway, New York City.
 PULLMAN—York Motor Car Co., York, Pa.
 REGAL—Regal Motor Car Co., Detroit, Mich.
 REO—Reo Motor Car Co., Lansing, Mich.
 RICHMOND—Wayne Works, Richmond, Ind.
 SHARP—Sharp Arrow Automobile Co., Trenton, N. J.
 SPEEDWELL—Speedwell Motor Car Co., Dayton, O.
 STODDARD-DAYTON—Dayton Motor Car Co., Dayton, O.
 WELCH—Welch Motor Car Co., Pontiac, Mich.

FOREIGN PLEASURE VEHICLES.

BENZ—Benz Import Co. of America, New York City.
 C. G. V.—C. G. V. Import Co., 1849 Broadway, New York City.
 DELAUNAY-BELLEVILLE—Brewster & Co.
 DE DION—De Dion-Bouton Selling Branch, New York City.
 DE DIETRICH—De Dietrich Import Co., 3 W. 44th St., N. Y. City.
 DELAHAYE—Delahaye Import Co., Park Ave., New York City.
 FIAT—Fiat Automobile Co., 1786 Broadway, New York City.
 HOTCHKISS—Hotchkiss Import Co., 1855 Broadway, N. Y. City.
 ISOTTA—Isotta Import Co., 1620 Broadway, New York City.
 LANCIA—Lancia Import Co., 244 W. 49th St., New York City.
 MERCEDES—Mercedes Direct Agency, New York City.
 PANHARD—Panhard & Levassor, 1881 Broadway, New York City.
 RENAULT—Renault Freres Selling Agency, 1776 B'way, N. Y. City.

COMMERCIAL VEHICLES.

AMERICAN TRUCK—American Motor Truck Co., Lockport, N. Y.
 BRUSH—Brush Runabout Co., Detroit, Mich.
 CARTERCAR—Motorcar Co., Pontiac, Mich.
 COMMERCIAL—Commercial Motor Truck Co., Philadelphia, Pa.
 GAETH—Gaeth Automobile Co., Cleveland, O.
 GRABOWSKY—Grabowsky Power Wagon Co., Detroit, Mich.
 HART-KRAFT—Hart-Kraft Motor Co., York, Pa.
 LAMBERT—Buckeye Mfg. Co., Anderson, Ind.
 LANDSEN—The Lansden Co., 54 Lackawanna Ave., Newark, N. J.
 LOGAN—Gramm-Logan Motor Car Co., Bowling Green, O.
 MANHATTAN—Mack Bros. Motor Car Co., Allentown, Pa.
 MAXWELL—Maxwell-Briscoe Motor Co., Tarrytown, N. Y.
 PITTSBURG—Pittsburg Motor Vehicle Co., Pittsburg, Pa.
 RAPID—Rapid Motor Vehicle Co., Pontiac, Mich.
 REO—Reo Motor Car Co., Lansing, Mich.
 RELIANCE—Reliance Motor Truck Co., Owosso, Mich.
 SPEEDWELL—Speedwell Motor Car Co., Dayton, O.
 STODDARD-DAYTON—Dayton Motor Car Co., Dayton, O.

TAXICABS.

ATLAS—Atlas Motor Car Co., Springfield, Mass.
 C.G.V.—C.G.V. Import Co., 1849 Broadway, New York City.
 DE DION—De Dion-Bouton Selling Branch, 43 Cedar St., N. Y. City.
 FORD—Ford Motor Co., Detroit, Mich.
 GENEVA—Cleveland Autocab Co., Geneva, O.
 ROCKWELL—Bristol Engineering Works, Bristol, Conn.
 SULTAN—Sultan Motor Co., 249 W. 64th St., New York City.

AMERICAN HIGH WHEELERS.

ANDERSON—Anderson Carriage Co., Anderson, Ind.
 CHICAGO—Black Mfg. Co., Chicago, Ill.
 HOLSMAN—Holtsman Automobile Co., Chicago, Ill.
 KIBLINGER—W. H. McIntyre Co., Auburn, Ind.
 RELIABLE—DAYTON—Reliable Dayton Motor Car Co., Chicago, Ill.
 SCHACHT—Schacht Mfg. Co., Cincinnati, O.

TIRES.

Ajax-Grieb Rubber Co., Trenton, N. J.
 Batavia Rubber Company, Batavia, N. Y.
 Consolidated Rubber Tire Co., Wall St., New York City.
 Continental Caoutchouc Co., Warren St., New York City.
 Courtney Rubber Company, 1976 Broadway, New York City.
 Diamond Rubber Co., Akron, O.
 Dow Tire Co., Boylston St., Boston, Mass.
 Dayton Rubber Mfg. Co., Dayton, O.
 Empire Automobile Tire Company, Trenton, N. J.
 Ennis Rubber Mfg. Co., 22 Commercial St., Newark, N. J.
 Firestone Tire & Rubber Co., Akron, O.
 Fisk Rubber Co., Chicopee Falls, Mass.
 G & J Tire Company, Indianapolis, Ind.
 B. F. Goodrich Co., Akron, O.
 Goodyear Tire & Rubber Co., Akron, O.
 Guaranty Faultless Auto Tube Co., 1779 Broadway, New York.
 Hartford Rubber Co., Hartford, Conn.
 Healy Leather Tire Co., 90 Gold St., New York City.
 Leather Tire Goods Co., Upper Newton Falls, Mass.
 Michelin Tire Co., Milltown, N. J.
 Morgan & Wright, Detroit, Mich.
 Motz Clincher Tire & Rubber Co., Akron, O.
 Newmastic Tire Co., 68th St. and Broadway, New York City.
 Pennsylvania Rubber Co., Jeanette, Pa.
 Pneu l'Electric Co., 1610 Broadway, New York City.
 Republic Rubber Co., 232 W. 58th St., New York City.
 Irving Snell, 16 W. Main St., Little Falls, N. Y.
 Samson Leather Tire Co., Broadway and 30th St., New York City.
 Swinehart Clincher Tire & Rubber Co., Akron, O.
 Zeglen Bullet Proof Cloth Co., Chicago, Ill.

TIRE ACCESSORIES.

Allen Auto Specialty Co., 1931 Broadway, New York City.
 Auto Tire Inflating Company, 104 S. Eighth St., Brooklyn, N. Y.
 Gilbert Mfg. Co., New Haven, Conn.
 Nathan Novelty Mfg. Co., 66 Reade St., New York City.
 Standard Leather Washer Mfg. Co., 24 Boudinott St., Newark, N. J.
 Travers Blowout Patch Co., 1779 Broadway, New York City.

BATTERIES.

Eastern Carbon Works, West Side Ave., Jersey City, N. J.
 Electric Storage Battery Co., Philadelphia, Pa.
 Excelsior Battery Co., 14 E. 116th St., New York City.
 Geissler Bros., 514 W. 57th St., New York City.
 General Storage Battery Co., Boonton, N. J.
 Lutz-Lockwood Mfg. Co., 39 Cortlandt St., New York City.
 Marks Storage Battery Co., 102 Jefferson Ave., Brooklyn, N. Y.
 National Battery Company, Buffalo, N. Y.
 National Carbon Co., Cleveland, O.
 Union Battery Co., Belleville, N. J.
 Witherbee Ignition Co., 1876 Broadway, New York City.

COILS.

Atwater-Kent Mfg. Works, Philadelphia, Pa.
 Autocoil Co., Jersey City, N. J.
 Connecticut Telephone & Electric Co., Meriden, Conn.
 Heinze Electric Co., Lowell, Mass.
 Herz & Co., 203 Lafayette St., New York City.
 Lavalette & Co., 112 W. 42d St., New York City.
 National Coil Co., Lansing, Mich.
 New York Coil Co., 338 Pearl St., New York City.
 Pittsfield Spark Coil Co., Dalton, Mass.
 C. F. Splittdorf & Co., 1679 Broadway, New York City.

**MAGNETOS AND TIMERS.**

Atwater-Kent Mfg. Works, Philadelphia, Pa.
 Bosch Magneto Co., 160 W. 56th St., New York City.
 J. S. Bretz Co., Times Building, New York City.
 Herz & Co., 203 Lafayette St., New York City.
 Hess-Bright Mfg. Co., Philadelphia, Pa.
 Lavalette & Co., 112 W. 42d St., New York City.
 Monitor Mfg. Co., Boston, Mass.
 Motainger Device Mfg. Co., 31 W. 42d St., New York City.
 Philadelphia Timer & Machine Co., Philadelphia, Pa.
 Remy Electric Co., Anderson, Ind.
 C. F. Splittdorf & Co., 1679 Broadway, New York City.
 F. H. Wheeler, Indianapolis, Ind.

PLUGS AND SWITCHES.

Jeffery-Dewitt Co., 217 High St., Newark, N. J.
 C. A. Metzger, 1629 Broadway, New York City.
 A. R. Mosler & Co., 163 W. 29th St., New York City.
 Safety Device Co., Indianapolis, Ind.
 Westchester Appliance Co., 1315 Canal Place, New York.

GENERAL IGNITION SUPPLIES.

American Electrical Novelty & Mfg. Co., 304 Hudson St., N. Y. City.
 Herz & Co., 203 Lafayette St., New York City.
 Remy Electric Co., Anderson, Ind.
 Kokomo Electric Co., Kokomo, Ind.

LAMPS.

Atwood-Castle Co., Amesbury, Mass.
 Automobile Supply Mfg. Co., 139 Emerson Place, Brooklyn, N. Y.
 Badger Brass Mfg. Co., Kenosha, Wis.
 J. W. Brown Mfg. Co., Columbus, O.
 Edmonds & Jones Mfg. Co., Detroit, Mich.
 Gray & Davis, Amesbury, Mass.
 C. T. Ham Mfg. Co., Rochester, N. Y.
 Rushmore Dynamo Works, Plainfield, N. J.

LUBRICATION.

H. T. Alexander & Co., 17 State St., New York City.
 Joseph Dixon Crucible Co., Jersey City, N. J.
 Duffy Grease Co., 520 W. 40th St., New York City.
 Harris Oil Co., Providence, R. I.
 Havoline Oil Co., 80 Broad St., New York City.
 Keystone Lubricating Co., Philadelphia, Pa.
 Wm. P. Miller & Sons, Mott Ave. and Hancock St., L. I., N. Y.
 N. Y. and N. J. Lubricants Co., 14 Chambers St., New York City.

SHIELDS, TOPS, AND BODY MOUNTINGS.

C. Cowles & Co., New Haven, Conn.
 C. A. Metzger, 1629 Broadway, New York City.
 Empire Auto Top Co., 509 W. 30th St., New York City.
 E. T. Burrowes Co., Portland, Me.
 Hill Mfg. Co., 27 Fuller St., Buffalo, N. Y.
 National Auto Top Co., 1904 Broadway, New York City.
 Pantasote Co., 11 Broadway, New York City.
 Randa Mfg. Co., Detroit, Mich.
 Sprague Umbrella Co., Norwalk, O.
 Troy Carriage Sun Shade Co., Troy, O.
 W. F. Polson, 27 Chenango St., Buffalo, N. Y.

CASTINGS.

Wm. Cramp & Sons Ship & Engine Bldg. Co., Philadelphia, Pa.
 Isaac G. Johnson & Co., Spuyten Duyvil, N. Y.
 Light Mfg. & Foundry Co., Pottstown, Pa.
 Paul S. Reeves & Son, Philadelphia, Pa.
 U. S. McAdamite Metal Co., Brooklyn, N. Y.
 Wetherill Finished Castings Co., Philadelphia, Pa.

CARBURETERS.

Allen Fire Department Supply Co., Providence, R. I.
 Byrne-Kingston Co., Kokomo, Ind.
 F. H. Wheeler, Indianapolis, Ind.
 Stromberg Motor Device Co., Chicago, Ill.
 Willet Engine & Carburetor Co., 764 Ellicott Sq., Buffalo, N. Y.

GEAR SETS, ETC.

Brown-Lipe Gear Co., Syracuse, N. Y.
 F. R. V. Auto Parts Co., 116 Nassau St., New York City.
 Merchant & Evans Co., Philadelphia, Pa.
 Sier Bath Company, 143 West 54th St., New York City.
 Warner Gear Co., Muncie, Ind.

RADIATORS AND MUFFLERS.

Briscoe Mfg. Co., Detroit, Mich., and Newark, N. J.
 McCord Mfg. Co., Chicago (Detroit, Mich.).
 Metal Stamping Co., New York City.
 Motainger Device Mfg. Co., Pendleton, Ind.

AXLES AND BEARINGS.

American Ball Bearing Co., Cleveland, O.
 F. R. V. Auto Parts Co., 116 Nassau St., New York City.
 Hess-Bright Mfg. Co., Philadelphia, Pa.
 Hyatt Roller Bearing Co., Newark, N. J.
 Merchant & Evans Co., Philadelphia, Pa.
 New Departure Mfg. Co., Bristol, Conn.
 R. I. V. Co., Inc., 1771 Broadway, New York City.
 Standard Roller Bearing Co., Philadelphia, Pa.
 Timken Roller Bearing Axle Co., Canton, O.

VULCANIZERS.

C. A. Shaler Co., Waupun, Wis.

CHAINS.

Baldwin Chain & Mfg. Co., Worcester, Mass.
 Diamond Chain & Mfg. Co., Indianapolis, Ind.
 Whitney Mfg. Co., Hartford, Conn.

PRESSED STEEL.

Driggs-Seabury Ordnance Corp., Sharon, Pa.
 A. O. Smith Co., Milwaukee, Wis.

SPRINGS.

Burnet Compound Spring, Inc., 738 Broad St., Newark, N. J.
 J. H. Sager Co., Rochester, N. Y.

STEERING GEAR.

Gemmer Mfg. Co., Detroit, Mich.
 Warner Gear Company, Muncie, Ind.

HORNS AND PUMPS.

Automobile Supply Mfg. Co., Brooklyn, N. Y.
 Comptoir d'Innovation Pour Automobiles.
 Elite Mfg. Co., Ashland, O.
 Gabriel Horn Mfg. Co., Cleveland, O.
 Gray-Hawley Mfg. Co., Detroit, Mich.
 Sireno Co., New York City.

SPARE WHEELS.

E. T. Burrowes Co., Portland, Me.
 Spare Motor Wheel of America, Ltd., Chicago, Ill.

SPEEDOMETERS.

Auto Improvement Co., New York City.
 Hoffercker Co., Boston, Mass.
 Jones Speedometer Co., New Rochelle, N. Y.
 Stewart & Clark Mfg. Co., Chicago, Ill.
 Veeder Mfg. Co., Hartford, Conn.
 Warner Instrument Co., Beloit, Wis.

SHOCK ABSORBERS.

Ernest Flentje, Cambridge, Mass.
 Hartford Suspension Co., Jersey City, N. J.

TOOLS.

Anderson Forge & Machine Co., Detroit, Mich.
 Buda Foundry & Mfg. Co., 26 Cortlandt St., New York City.
 Coes Wrench Co., Worcester, Mass.
 Noonan Tool & Machine Co., Rome, N. Y.
 Oliver Mfg. Co., Chicago, Ill.
 Perfection Wrench Co., Port Chester, N. Y.
 Rubly Mfg. Co., Tuckahoe, N. Y.

IN GENERAL.

American Automobile Association, 437 Fifth Ave., New York City.
 American Metal Hose Co., 173 Lafayette St., New York City.
 American Thermo Ware Co., 16 Warren St., New York City.
 American Thermos Bottle Co., Brooklyn, N. Y.
 Austro American Separator Co., 5710 Hough Ave., Cleveland, O.
 Automobile Club of America, West 54th St., New York City.
 Brandenburg & Co., 1777 Broadway, New York City.
 Brown Co., Syracuse, N. Y.
 Calorie Mfg. Co., 2110 Alleghany Ave., Philadelphia, Pa.
 Charles E. Miller, New York City.
 Charles J. Downing, 54 Warren St., New York City.
 Class Journal Co., 239 West 39th St., New York City.
 Columbia Nut & Bolt Co., Bridgeport, Conn.
 C. A. Buffington & Co., Berkshire, N. Y.
 F. A. Brownell Motor Co., Rochester, N. Y.
 Federal Mfg. Co., 104 Cushing St., Lowell, Mass.
 Garage Equipment Co., Milwaukee, Wis.
 George S. Sherman, Great Neck, Long Island, N. Y.
 Gloversville Auto Glove Co., Gloversville, N. Y.
 High Wheel Auto Parts Co., Muncie, Ind.
 Hydraulic Oil Storage Co., 25 Broad St., New York City.
 H. & C. Bottle Co., 652 Broadway, New York City.
 I. J. Smith Mfg. Co., 4233 Park Ave., New York City.
 International School of Aeronautics, Morris Park, Westchester, N. Y.
 J. H. Bunnell & Co., 20 Park Place, New York City.
 John A. Saliman & Co., 17 Bromfield St., Boston, Mass.
 John S. Wilkinson Co., Newburgh, N. Y.
 Long Island Auto Supply Mfg. Co., 31 Grant Sq., Brooklyn, N. Y.
 Motor & Accessory Manufacturers, 414 Union Bldg., Newark, N. J.
 N. Lazarnick, 29 West 42d St., New York City.
 National Retail Automobile Dealers' Ass'n, Oshkosh, Wis.
 National Surety Co., 116 Broadway, New York City.
 Pneu l'Electric Co., 1610 Broadway, New York City.
 Quincy, Manchester, Sargent Co., Plainfield, N. J.
 Raimes & Co., 54 Ferry St., New York City.
 Randall-Falchney Co., Boston, Mass.
 Royal Equipment Co., Bridgeport, Conn.
 Seamless Rubber Co., New Haven, Conn.
 Shelby Steel Tube Co., Hudson Terminal Bldg., New York City.
 Shore Instrument Mfg. Co., 226 West 24th St., New York City.
 Spicer Universal Joint Mfg. Co., Plainfield, N. J.
 Standard Welding Co., Cleveland, O.
 Stanley & Patterson, 23 Murray St., New York City.
 The Motor Accessories Co., 43 Cortlandt St., New York City.
 The S. B. Specialty Co., 143 West 54th St., New York City.
 Travelers' Insurance Co., Hartford, Conn.
 Vanguard Mfg. Co., Joliet, Ill.
 Weed Chain Tire Grip Co., New York City.
 Wilson Trading Co., 46 Cortlandt St., New York City.
 W. M. Briggs, 136 Liberty St., New York City.
 Y. M. C. A., 316 West 57th St., New York City.
 York Auto Wheel Co., York, Pa.



AMERICAN MOTOR CAR MANUFACTURERS' ASSOCIATION

By ALFRED REEVES, GENERAL MANAGER A. M. C. M. A.

UNDER the careful leadership of some of the greatest men in the industry, who at all times have carried out its original purposes, the American Motor Car Manufacturers' Association is classed in the front ranks of industrial organizations of its kind. It has assumed the leadership in motor car organizations and is now looked upon as an authority and a power for good in its chosen field. The product of its members bearing the stamp of "Standard Manufacturers" is received with favor throughout the civilized world, and the public that buy cars feel that in buying a car which is enrolled in the American Motor Car Manufacturers' Association are securing cars of reliability and for the money invested. Membership constitutes the badge of all that is desirable in motor car trade.

In all that has stood for the advancement in the producing, disposing and using of motor cars, the A. M. C. M. A. has taken a leading position. The real power of the association may perhaps be judged best by the fact that estimates place 65 per cent. of all cars made and sold in America to the credit of A. M. C. M. A. members.

During the four years of its existence the association has accomplished a world of good, not only for its members, but all interested in the making, selling and operating of an automobile.

The automobile industry, being extraordinary in many respects, it was natural that its trade association should have a growth of a phenomenal sort in its four years of organization, during which time it has accomplished so much for those involved in the trade and pastime. It has worked consistently for its members to the ultimate benefit of the buyer.

The association was formed in the belief that competitors in the business had certain mutual interests that could best be cared for by a central organization. Independence is the keynote, for its members believe competition brings advancement. Within its ranks are the makers of the highest as well of the lowest priced cars, including all styles and types. It is believed that these makers offer the best values, and this would seem self-evident, for they are selling the largest number of cars.

It aims to further the use of motor cars in general and to assist the common interest of its customers as well as its members. Buyers of cars made by concerns in the A. M. C. M. A. are assured of proper construction and materials at fair prices. The companies conduct their business independently under their own business methods, each endeavoring to secure the greatest favor and trade from the public. Their interests are identical only in so far as they are concerned in the work of the association which relates to the obtaining of combined privileges for their good with the ultimate object of securing for the public the very best in automobile construction. The work of the association at all times is to obtain privileges and information

such as will better enable the various standard manufacturers to retain their present leadership in motor car building.

Information and benefits are sought that will permit A. M. C. M. A. members to produce the best cars at the lowest possible cost, so as to offer their cars to the general public at prices within reason and yet permit of a fair margin of profit. When a maker can combine the maximum of quality at a minimum of price, the trading is certain to be satisfactory to buyer and seller.

While much of the work of the association furnishes benefits of an abstract nature which is enjoyed by the trade and public in general, there is more of a concrete nature that involves the members alone.

Compilation of statistics, both here and abroad, furnish a valuable guide to the makers. The lists of agents and dealers is another good work of the A. M. C. M. A. Uniform guarantees that are liberal to the buyer and fair to the maker are advocated, while plans for advertising and information regarding the value of mediums are offered. Work for a national law providing for a single license number, good in every State; the perennial question of good roads and legislative matters are handled by competent committees. Every year hostile legislation is opposed and many unreasonable bills have been withdrawn through the work of the legislative committee.

Its work in the matter of good roads has been of great importance, and on this department alone many thousands of dollars has been expended. There is unquestionably a great improvement under way for improved highways, and undoubtedly the A. M. C. M. A. was of great assistance in the bringing about of this condition.

One of the best works of the association is the publicity department, which aims to supply authentic information to the newspapers and trade publications. Articles of a technical and a statistical nature are supplied for the information of the general public, all of which has contributed to a more thorough understanding of the automobile, its rights and the rights of its owner and driver. Such things as liability insurance, freight rates, larger and more freight cars, are given attention.

In the early days, when the foreign cars were factors in the trade, a representative was maintained abroad and a delegate sent from this country to attend the foreign shows. A careful record is kept of importations, which are rapidly decreasing.

There are scores of other things which the association does quietly and industriously, but those mentioned will give a fair idea of its work. On its committee of management and in its membership are the pioneers and most of the leading men of the automobile industry, including Benjamin Briscoe, chairman; R. E. Olds, H. O. Smith, G. Vernor Rogers, W. H. VanDervoort, Charles Lewis, W. C. Marmon, C. G. Stoddard, S. H. Mora, and Alfred Reeves, general manager.

GROWTH OF MOTOR AND ACCESSORY MANUFACTURERS

THOSE who have followed the course and rise of the automobile show in this country can readily recall the time when there was no such thing as an accessory exhibit—when the vast amount of floor space represented by balconies and galleries and the hundred and one odd corners and nooks that are now so zealously sought out and filled were vacant. Simply because there was no one to fill them—there were no manufacturers of accessories pure and simple, and the dealer in automobile supplies had yet to come into existence, so that an automobile show could then be comprised by the exhibits of its main floor and with room to spare. Then along come the accessory manufacturer and, with the increasing demand for space in which to show cars, he was perforce relegated to the upper regions, or

to the basement. He had to bid for space as an individual and as the weight of his protest as such was small, he had to take what was handed out, or nothing at all.

But in the course of a surprisingly short period, the accessory manufacturers became so numerous that it was quite evident that in the aggregate their weight would be sufficient to exert no little influence, not alone for better treatment at the hands of show-managing committees, but likewise for many other purposes where reforms were needed. The outcome was the incorporation of the Motor and Accessory Manufacturers. Within a very short time after its organization the new association included practically all the important accessory manufacturing interests in the country in its membership.



The present officers are H. S. White (National Tube Company), president; H. E. Raymond (B. F. Goodrich Company), first vice-president; H. T. Dunn (Fisk Rubber Company), second vice-president; F. E. Castle (Gray & Davis), third vice-president; W. S. Gorton (Standard Welding Company), treasurer, and P. S. Steenstrup (Hyatt Roller Bearing Company), secretary, the headquarters and office of the secretary being located in the Union Building, Newark, N. J.

The directors are Clarence E. Whitney (Whitney Manufacturing Company), D. J. Post (Veeder Manufacturing Company), C. T. Byrne (Byrne, Kingston & Company), H. W. Chapin (Brown-Lipe Gear Company), E. S. Fretz (Light Manufacturing & Foundry Company), and L. M. Wainwright (Diamond Chain & Manufacturing Company).

In order to confine the expense of its members for space at automobile shows to legitimate events of this kind, the Motor and Accessory Manufacturers issue sanctions for shows, and

the members of the association do not exhibit at those which have not received the approval of the governing body. And by dealing with show managements as a unit, much expense and inconvenience is saved the members, the Motor and Accessory Manufacturers being one of the largest single purchasers of space at the Palace this week. The entire needs of its membership are contracted for *en bloc* and the association itself then parcels out the space and awards the different locations, the accessory manufacturers themselves thus having no dealings whatever with the show management as individuals.

But it is not alone in the matter of shows that the Motor and Accessory Manufacturers has succeeded in benefiting its members, the association maintaining a credit department which has proved of considerable value, and it has also lent its aid as a body to the procurement of more equitable freight rates from the railroads, while other matters affecting the interests of its members as a whole have likewise come in for attention.

IMPORTERS ARE SHOWING AT PALACE AS A BODY

IN view of the fact that the imported cars represented in this country are now being shown by their agents in connection with the A. M. C. M. A. show in the Palace, the impression is current that each exhibit represents the individual and independent efforts of its sponsor, and that the Importers' Automobile Salon had nothing to do with the show as an organization. This is not the case, as when the question of exhibiting foreign cars this Winter came up some time ago, the Importers' Automobile Salon came to an agreement with the American Motor Car Manufacturers' Association and contracted for 15,000 square feet of floor space, all of which is located on the main floor of the Palace. The Importers incorporated early in 1904, the objects being to hold shows and further the introduction of foreign cars in this country generally. Its first show was held on the top floor of Macy's in December, 1904, and introduced the plan of uniform decorations for exhibits, which has since been universally adopted in this country, reaching its climax in the Importers' show in the Garden last January, which was generally conceded to be the most artistic conception ever produced for an American automobile show.

When first organized the membership of the Importers' Salon was very small, but its work of encouraging the introduction of

foreign cars and of cooperating for the mutual benefit and protection of its members which has been carried out in the interim, has proved so successful that now it numbers practically every importer of foreign cars in the country in its ranks, even including the New York Taxicab Company.

C. R. Mabley acted as manager up to a short time after the holding of the Garden show last January, when he resigned, and the efficient work of Walter R. Lee, up to that date secretary of the organization, was recognized and he was promoted to the vacancy left by Mr. Mabley's resignation. The other officers of the Salon are, Andre Massenat, president; W. H. Barnard, vice-president; Paul Lacroix, secretary; W. C. Allen, treasurer, the directorate comprising E. R. Hollander, A. A. Barrelet and K. Neubauer, in addition to the officers already named. Charles H. Sherrill acts as counsel to the organization. The members include the Renault Frères Selling Branch, Panhard & Levassor, C. G. V. Import Company, Hol-Tan Company, Delahaye Import Company, Palais de l'Automobile, S. B. Bowman Automobile Company, De Dietrich Import Company, New York Taxicab Company, Brewster & Company, Benz Auto Import Company of America, the Hotchkiss Import Company, and the Fiat Automobile Company.

RETAIL DEALERS HAVE STRONG ARM IN N. R. A. D. A.

JUST a little more than a year ago, the National Retail Automobile Dealers' Association came into being—during the course of the 1907 Chicago show, to be more definite, its inception being due to the foresight of a few progressive dealers attending that show. They laid the plan before a number of their confrères at the time, and the result is already history, the N. R. A. D. A. now being able to celebrate its first anniversary.

While this brief résumé of the manner of its coming into being suffices to tell the story of its creation, it does not by any means convey the slightest idea of the task confronting its organizers, prominent among whom are C. F. Jensen, Joliet, Ill., president; Rudolph Hokanson, Madison, Wis., vice-president; L. Ohnhaus, Ft. Wayne, Ind., treasurer, and J. A. Crum, Oshkosh, Wis., secretary. These dealers and their confrères on the board of directors, D. P. McClure, Oskaloosa, Ia.; J. C. Tanberg, Eau Claire, Wis., and J. B. Sutter, Burlington, Ia., were instrumental in fostering the idea of organizing a cooperative association of automobile dealers and of carrying the plans into execution at the Chicago show a year ago.

So far so good, but only those who have had experience in the formation of similar trade organizations can appreciate the true extent of the job undertaken by these progressive dealers.

President Jensen and his associates of the N. R. A. D. A. have realized this to the full from the very start, and there are accordingly no sinecures attached to the Association; the directors and officers receive no compensation for their work in connection with it and their reward can come only through the Association's success, and then only to the same extent that it will benefit every automobile dealer who becomes a member. The dues are merely nominal. It is plain then that there are no selfish motives actuating its incorporators in their efforts to place the retail automobile business on a more satisfactory and profitable basis, and that their work should be seconded and encouraged by every automobile dealer who is alive to his own interests becoming a member of the Association.

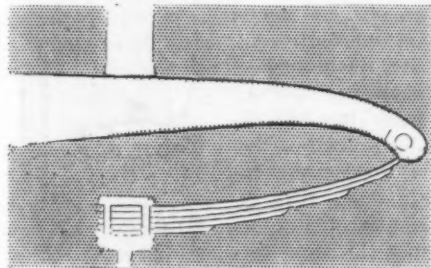
Generally speaking, the objects and purposes of the N. R. A. D. A. are along lines similar to those of any organization formed for the purpose of mutual benefit and protection by dealers engaged in marketing the products of any industry. Such organizations when founded and conducted on business principles for the sole benefit of their members have almost invariably proved highly successful in achieving the ends sought.

The second annual meeting of the Association will be held during the Chicago show next February.

THE MECHANICAL LESSON OF THE PALACE

By THOS. J. FAY.

LET it not be supposed that a great exhibition like the one now going on at the Grand Central Palace can be held year after year and no good to come of it. China tried to live in isolation and that ancient empire fell away to nothingness because the time came when she had nothing more to teach her progeny, nothing more to learn from herself, and nothing to gain by living. The automobile industry, aside from any attempt to stimulate trade, has much to learn, and of progress the half of it is yet as the unearned increment. Each year with its offerings renders up an accounting on a scale far greater than the previous, and the



Front End of Chassis (Frame).
Showing increased depth and decreased curvature.

question is as yet unanswered as to when the end of the years of great improvement will say a last farewell.

The doings during 1908 in preparation for the 1909 trade were the most active and, on the whole, the most advanced in the way of practical results. The plausible theo-

ries were given a working chance, the after thoughts were put in better settings, and the things that promised much and delivered little were withdrawn from active service. The effect of quantity on cost is to be seen at every hand, but all the improvements to be noted must not be understood as the product of doing things on a large scale. As a matter of fact, many of the crystallized features in the 1909 automobiles were long in contemplation, awaiting the day when they could be utilized to advantage, and in many instances they took the place of less desirable schemes, thus rendering the improvement of double value.

Classification of the Automobiles Available.—Variety is the password, and a cleaner line of demarcation is to be distinguished. The condition of "chaos" that once permeated the situation is gone. As it is, the respective classes or types of automobiles are distinctive and are capable of being classified.

Runabout Types.—In the main, this class of automobiles are of the single-seat variety, but it cannot be said of them that they are confined to the cars in which the motor is of the one-cylinder design, since some have two cylinders, and the four-cylinder runabout is also to be seen. In some cases the little cars have accommodations for more than two persons, in that either a rumble seat is furnished or a folding seat is provided. In general, they have longer wheelbase dimensions than formerly, and they are very much more formidable than even some of the "roadster" types of even last year.

Roadster Types.—They cover a wide range, both as respects the size of the cars and the power available. In some cases it is difficult to tell a roadster from a runabout, and again the roadster looks like a big racing machine. The roadsters use motors from the low-powered "double opposed" to the finest examples of the "six," with "fours" numerous.

Light Touring Class.—There is probably no other division of the industry that has undergone nearly the same evolution as the light touring cars. They are in great presence, in divers sizes, and they represent value such as was never before to be seen. In the cars in this class will be found more capable propositions than were classed as "big" touring cars even last year, and these same light touring cars would put to shame the "foreign red devils" that cost \$10,000 less than four years ago. The wheelbase ranges from 100 to 110 inches, and the motors are of the

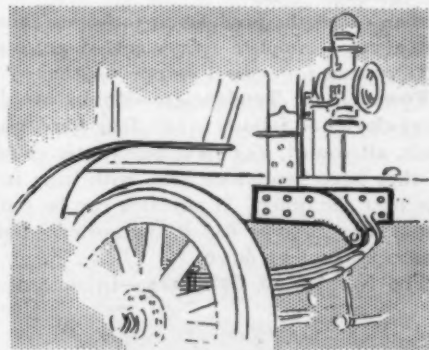
four-cylinder type, for the most part rated at from 24 to 30 horsepower. As a rule, the bodies are of the five-passenger touring class (straight-line effect), with ample accommodation and artistic in effect. On the whole, it is these automobiles that will be the mainstay of the makers in this field for the immediate future.

Standard Touring Cars.—These are automobiles in the broadest sense of the word. When the dictionary is restandardized and the word "automobile" is defined the definer will have the image of these cars in mind, and he will be right. Any further play on words is a loss of time, and yet to dismiss the most interesting part of the exhibition without affording to the cars as much space as is accorded the runabout types would seem to be ill-advised. In these cars the power plant is the most complete and systematic piece of sturdy mechanism that man ever devised. The wheelbase is long, ranging from 110 inches as the low range to 140 inches (or thereabouts) in the extreme examples. The body work, aside from the luxuriousness and the space afforded, is art personified. The silent performance is the wonder of the age, and it is due to absolute precision of fit of the 2,400 separate parts that enter into the construction of an automobile of this class. One single loose member in a car of so much power and speed would make itself known were it of an ill fit, or if the relations were out of harmony. The motors range from the "big six" down to the four-cylinder examples of equal or even greater power.

Town Cars.—In this class will be found cars not with great power or of a long wheelbase, for neither are necessary. The wheelbase is not far from 100 inches, as an average figure, and the power is rarely over 30 horsepower. With a short wheelbase, the road performance is quite in accord with the needs, and, as the speed is not to be high, considering paved streets, the power does not have to be over the maximum stated, while some of the examples are even with half (or less) of the figure given. The body work in town cars is the exterior feature that attracts attention, although from the mechanical point of view it is the least of the features to be considered. At all events, the body work in the town cars is the most luxurious and the most costly of all the work there to be seen. The bodies are made in broughams, landaus and limousines, richly upholstered and fitted with every convenience possible to place on wheels, from the point of view of convenience and comfort.

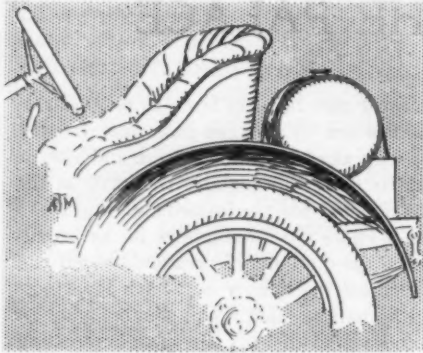
Buggy Types.

The surprise of the exhibition is due in no small measure to the number of cars of this type to be seen, and again to the fact that while the buggy type has held to its aims it has expanded and amplified. The uses to which these cars can be put, in view of their low first



Manhattan Commercial Front Spring
Hanger Shows Stability.

cost, coupled with their extreme simplicity and low cost of maintenance, are not to be lightly regarded. They serve for a wide range of purposes, largely in the utility zones of activity, and they number their friends by the thousands among the pleasure-seekers as well. The power for speed is high, which is but a way of calling attention to the fact that they will make headway on all kinds of roads in inclement weather. The body work holds to the buggy type as it was handed down by the "craft," and the reasons are good.



Gasoline Tank on Rear of Chassis.

goodly showing of cars for this service, and the schemes of design are such as to assure a low cost of maintenance.

Specialties.—For public service there are fine examples of automobiles to be used in fire, hospital and police service. Most of the companies who cater to this class of trade find it of small avail to exhibit the products and are therefore content to depend upon literature to make known the facts. But if there are automobiles for municipal work, it is true as well that "sight-seeing" automobiles and cars for hotel "bus" service are in a high state of development. Indeed, this phase of the industry has grown a wide pace, and the demand is strikingly large, with small chance of having reached the limit in view of the wide field as yet fully explored.

Having thus introduced the several types of automobiles to be seen at the show, it may not be out of place to discuss the "mechanical trend" in some detail, hoping thereby to evolve the drift of events. But if it is expected that this exposé will be as an indication of revolutionary thoughts, disappointment will await the reader. A thorough examination of all the products at the show fails to develop anything but a more complete refinement of accepted principles as they have existed for several years.

Power Plant Tendencies.—Motors are divided up among the three classes as follows: (a) four cycle, water cooled; (b) four cycle, air cooled; (c) two cycle, water cooled; in the proportion as they have heretofore held, with little indication of gain, the one over the other. If anything can be said, it will be to maintain that each type has its supporters, and they find no valid reason for backing down.

The Number of Cylinders.—In spite of all the talk that has gone the rounds, the fact still remains that the situation is substantially as formerly, in that the single-cylinder propositions are looked upon as a stable basis, serving well in the cases requiring about 10 horsepower. There is even a tendency to take advantage of the inherent econ-

Taxicabs.—They differ but little from town cars, unless it is that the body work is with a view to hard usage. The power plant is generally identical, with a short wheelbase for the same reason, and as to speed there is no occasion for gearing to a high ratio, hence the power is limited as well. There is

omy of the single-cylinder idea. It is well known that a single-cylinder motor indicates a high thermal efficiency, which is but another way for saying that the gasoline consumption is low in the type. With well-balanced reciprocating members and fairly long stroke, if the flywheel is suitably designed, the single-cylinder motor serves as a suitable source of power in the automobiles weighing not over 1,000 pounds.

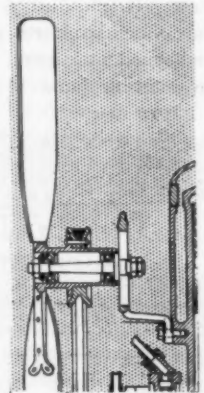
The double-opposed idea is still to be seen in the cars in which its application has been found to be advantageous, and there are fine examples of the scheme scattered all through the show. There are no three-cylinder motors to be seen, the reason for which has never been adequately explained. Of the "fours" it might be said, "The woods is full of them," and of the "sixes" they are there, in far greater and more imposing presence than ever before.

How the Cylinders are Fashioned.—"Individual" cylinders are about as prevalent as before. "Cast in pairs" has held all former ground. "En bloc," representing the real advance, has numerous good examples. Gray iron is used, a little better than in former years, walls more uniform, and the desire to attain tissue-paper thickness has retired to obscurity. Water jackets extend down to about the lower end of the stroke, thus affording a cooling medium on the exterior surface of every portion of metal that entertains hot gases on the interior surfaces. Steam pockets are carefully avoided, and unequal expansion is a phenomenon of the past, in so far as skill can influence the situation.

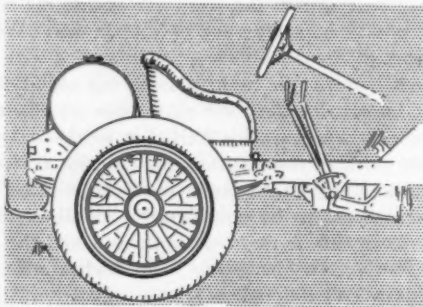
Crankshafts.—The five-bearing type for four cylinders is fighting the two-bearing type for supremacy. The three-bearing crankshaft is as a disinterested spectator on neutral ground. In the show, it is fair to say, the three-bearing crankshaft is in the greatest presence, with the five as a close second. As to the bearings, it is to note that the "plain" type is still the mainstay, with here and there a fine example of what can be done with ball-bearing crankshafts. The ball-bearing type seems to hold in every case in which it is so fortunate as to gain a footing, but it does not spread rapidly because of the higher cost. If plain bearings will do the work, they being cheaper, the makers naturally hold to them. The materials of the crankshafts are not "jewelry steel," as some of the alloyed products are called, unless in a few cases. The plan seems to be one in which advantage is taken of the fact that heat-treated (special) steel holds the requisite qualities to a marked degree, and, since a slight increase in "section" lends enormous extra ability, the section is a little "fatter" and the material is far easier to work, while the cost of replacement is relatively very low indeed.

Aluminum vs. Cast Iron.—In crankcases and the housings for gear sets, aluminum is the main product. Cast iron is used in isolated cases. That cast iron is the superior metal, from the strength point of view, is not to be gainsaid. That aluminum is lighter goes without saying. In all the examples there are evidences of refinement, in point of design, and here and there are examples in which provision is made to get at the bearings through covers big enough to serve the purpose. The bearing supports are more stable than formerly, and the means for disposing of the "used" oil are carefully worked out.

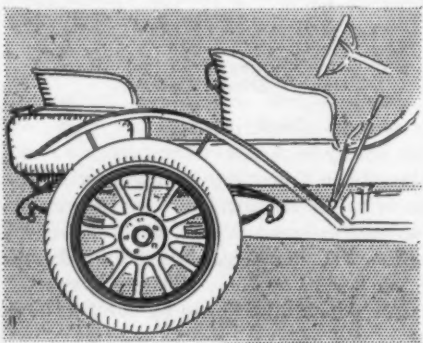
Valve Gear.—The valves of special steel, in probably every instance, are not extra large, nor are they small. They are, in point of area, as large as possible, without becoming noisy. This question of noise has been looked after to a mighty degree. Makers have looked at the question from the angle that the patrons take, and the result is a happy medium between large valves and noiseless performance. The tappets and guides are with adjustments in most cases, and the "play" is so little as to abort the tapping noise that made automobile motors conspicuous up till a short while ago. By suitably shaping the cams, it was



Fan Pulley with Ball Bearings.



Roadster Seat Well to the Rear.



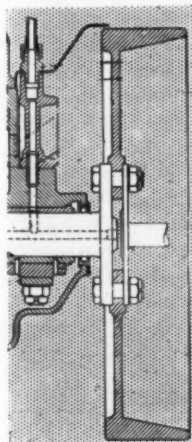
Rumble Seat Over Gasoline Tank.

found possible to do away with almost all of the lost motion, instead of the large amount that formerly did obtain (as much as 1-16 inch in some cases), and means are provided to cushion the "tap" in notable instances. The half-time gears are more healthy than in earlier examples, in that they are more securely keyed on to the shafts and spindles, while the gears themselves are of wider face and better material than before.

Clutches.—A pretty mess. With tendencies, without any question, tendencies that cannot be defined at this time in bold language. The multiple disc clutches are slowly taking definite shape, along lines in which an attempt is being made to depart from the trouble tendencies of the type. It is well understood that a large number of thin discs will ultimately give trouble because the edges of the discs as they press against the keys will "broom" and then the members will not engage. It is also known that oil will become "gummed" and then the clutches will fail to do the required work. Then there is the question of "flashing" the oil, if the pressure is high and the clutches slip.

The tendency is in the direction of a less number of wider discs, lower pressure, and materials that will show a high coefficient of friction at low pressures in oil with a high flash point and free from tendencies to "gum." The discs are naturally of an increased diameter, and in many cases "cork inserts" are used; they afford the requisite advantages. Besides multiple disc clutches, there are many of the well-known cone clutches in use, some with leather faces, but more with leather together with "cork inserts," it being the case that the presence of oil on the faces will work no ill effect if the cork is used also. Besides the clutches, as before stated, there are examples of discs with grooves in the faces, and some examples of band clutches as well. On the whole, the clutch situation is in a very encouraging state, and failures (outright) will not be found in the cars at the show.

Transmissions.—Three speeds and reverse, direct on the high, selective, and the story is three-quarters told. A few of the gear-sets are with four speeds, direct on high or second; and of the "planetary" type they are used in the well-known cases in which the advantages are not to be gainsaid; of the progressive types of gears there are few examples, those of the makers that have always adhered to the principle claiming for them that ease in shifting that comes, with no chance of sliding into the wrong speed, or stalling the motor. The materials used in the gears is mostly "alloy steel" of the finest grades, and trouble in gears due to inferior material is now unheard of.



Separate Flanged Cardan Shaft.

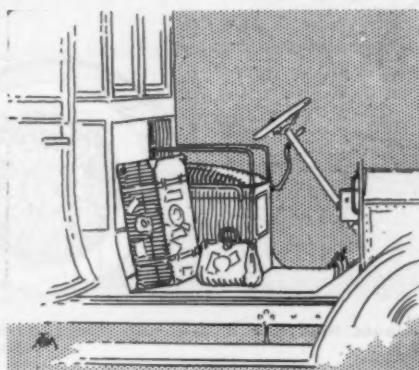
Live Rear Axles.—With floating, semi-floating and keyed shafts, all are to be seen, under such splendid conditions of design, material and workmanship as to render a choice as the expression of a prejudice rather than as a necessity. The " housings" are far more stable than formerly, notwithstanding the fact that excess weight has been eliminated very largely, if not completely. Struts are still used, but they are more stable, and in some cases the housings are as "drawn steel tubes," free from joints, and they are quite as good as they look. The "spring perches" are not "brazed," but are allowed to slip on the

tube, within limits, doing away with the strains that formerly did reside in the springs on that account. The "differential" and the bevel drive, all housed in, with adequate means for oiling, frame up for continuous and noiseless performance as never before, while the ground clearance is now adequate.

Side Chain Drives.—From abroad came a story that the "sprocket," as a passing fancy, is losing ground. They may be copying some of our "shaft drives" over there; they can well afford to do it; we always had them on the hip in this connection.

But let us not go wild about their slants. In "stable America" there is a place for everything, and we know the value of putting the right horse in the right stall. That the chain situation is now just as good as it ever was, is shown by statistics which did not prevent the multiplication of the "shaft drives." The distribution has followed along natural channels, and that the same is now fairly representative of what will be a natural future is assured by those who seem to be abreast of the times.

Brakes.—Law, and more law, all about brakes, rather goes to show that they were not all that they should be in the past. The new crop is in anticipation of the fact that the community will demand good brakes in the future. Time was when cars were studded with brakes, none of which was over good, and numbers were placed to make up for the deficiency in point of

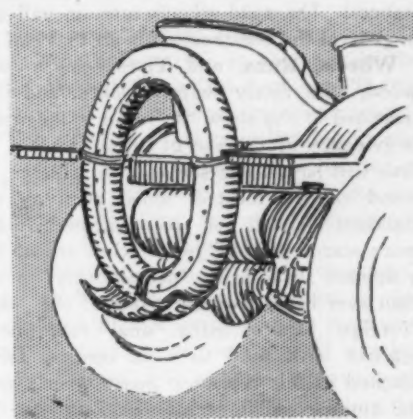


Baggage Space in the Atlas Taxicab.

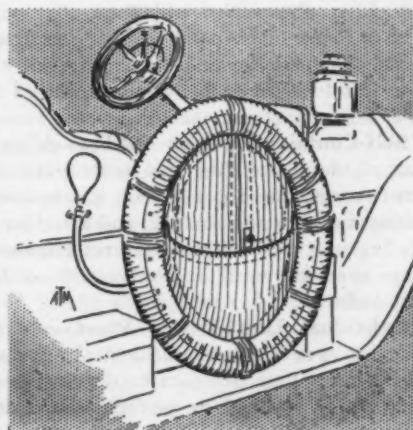
quality. In the 1909 cars the brakes are capable in the extreme, and, as a result, few in number. In some cases there are two sets in the rear wheel drums (internal and expanding), while in other examples the old idea holds, in that one set is on the rear wheels, and a differential brake is used for service. In all the examples the drums are of increased diameter, and the faces are ample to assure long life. The facings are all the way from metal to metal to "cork inserts," with a decided tendency to get away from the class of materials that will not stand heat. Fortunately, the properties of cork are such that they will not char and the presence of oil does good. The further tendency is in the direction of the use of asbestos supported by a wire mesh to give strength.

Axles in General.

—Departing from the question of the types of "live rear axles," it is to note the very general use of I-section axles, both for rear and front. They are die forged, frequently without welds, and so nicely proportioned for the work as to be difficult to improve upon. In heavy trucks the axles are both I-section and square, depending, on circum-



Good Provisions for Extra Casings



Waterproof Cases for Extra Tires.



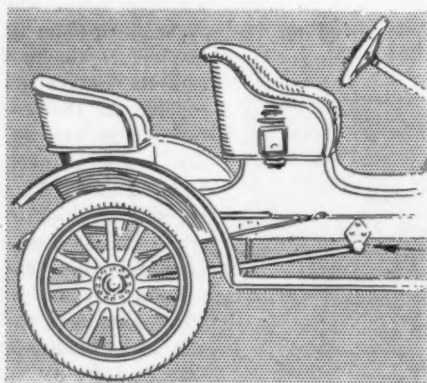
stances. The road wheels turn on ball and roller bearings, and in general the construction is all that can be desired or suggested.

Wheels, Rims, and Tires.—As a rule the wheels are of wood, with nicely shaped spokes, and in so far as can be determined at the show the wood is up to a high standard. There is evidence of the use of "disc" wheels, which in the course of time will have to be seriously considered, unless a new supply of wood can be located, wood such as will maintain the high standard claimed for second growth hickory, which is growing more scarce year by year. Rims are up to a high standard with a decided showing of "demountable" methods. Tires are larger than ever before, which is one of the year's improvements. The "foreign" idea of using "dual" rear pneumatic tires (as is the practice with solid tires on commercial trucks) has not been adopted in this country. Spare wheels are in good demand, and the autoing public seems to take to the idea.

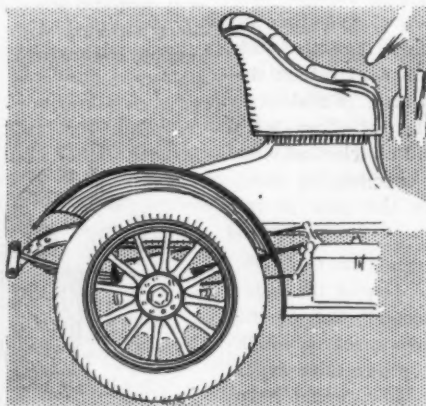
Chassis Features.—Channel sections of alloy or special carbon steel seem to be the mainstay. Wood is used to some extent. The autoing public now fully understands that wood is adequate for the purpose, and they also know that the channel section is appropriate. Referring to the channel section, the shapes are much more stable than before and the "drop frame" idea is much in vogue, especially in town cars, but not confined

tions, because the housings are short. Universal joints are used between the units, and they, in turn, are housed in, thus preventing the oil from escaping and "grit" from entering. In this class of work, it is the aim to be able to remove one of the units without disturbing the other, and this plan is nicely carried out in the examples to be seen. It is fortunate for the purchasers of cars that they can embrace the talking points of either school, with no very great fear of having to suffer for their choice; both plans work and that is all the purchaser, in any case, is entitled to, unless it is that he would like to bolster his business acumen to the extent of enjoying the feeling that would be his were the plan he rejects to prove a failure. To this extent the 1909 purchaser is booked for a disappointment.

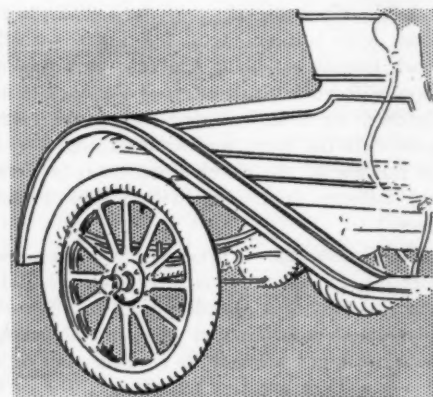
Spring Suspensions.—The springs as they now obtain "can" the vibrations as they never did before. The reason for this is not on the surface, nor is it well understood by autoists in general. It was not so long ago that it was the style to lay the failures up to the quality of the material used in the springs that failed to render complete returns, when as a matter of fact, it was because enough material was not used. When, in the attempt to improve, a scant amount of inferior material was supplanted by a more scant quantity of the finest material, it came as a surprise when the trouble increased instead of decreasing. It



Ball and Socket Distance Rod.
(Overland.)



A Very Effective Mud Guard.
(Mitchell.)



Mud Guard of Length and Sweep.
(Maxwell.)

to them. As a rule, the frame is deeper and the flange is wider, while the "laterals" are nicely placed and well braced.

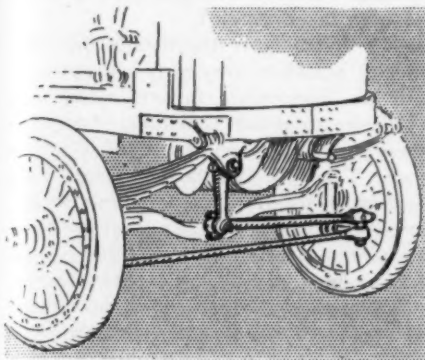
Three-point Suspension.—In point of theory, this principle is adapted by every builder of automobiles, but it is not directly applied in all cases. When the unit power plant is used the three-point suspension is invariably directly advanced. When, however, the separate unit system is used, then the three-point suspension is applied to the separate units. In some cases the principle is so deftly applied that only the designers are fully alive to the fact. In other words, they may fasten at four points, but closer observation will show that one of the fastenings is with a "clearance" hole, so that the fourth point is merely a "rest," the advantages of which are self-evident. On the whole, it is fair to observe that the principle of the three-point suspension is in pretty general use.

Self-Contained Power Plants.—A goodly number of the cars of the year embody the self-contained power plant idea. In other words, the motor, clutch, and transmission gear-set are all enclosed within one housing, and the claim is made for them that the bearings will maintain correct alignment. Nothing could be more near the truth, and the plants so designed are very compact indeed.

Individual Unit Power Plant.—As against the self-contained power plant, there is the old standard construction in which every unit is separate. In this construction all the bearings are maintained in perfect alignment, because there is no rigid connection between the separate units, and within the respective housings the alignment is under the best possible condi-

did not take long to determine that it was largely a matter of supplying the requisite quantity of material to accomplish the task. A pound of steel will dissipate a certain amount of energy on a basis that will not shorten the life of the steel below a commercial point. If the steel is of a fine grade, it will have a longer life, but it is also true that however good the steel, if it is sadly overworked its life will be short indeed. In the cars of the year this matter is on a fair footing, and as a result the springs, while they look very much as in the past, they are more capable. There is a growing tendency in favor of "scroll" types of springs, in relation to which there is an argument that speaks well of them. Otherwise the situation is as formerly, excepting that it is the custom now to use enough material to perform the service.

Ignition Systems.—Magnetos are now regarded as standard, and they are used extensively, if we may not say to the exclusion of the other systems. In every case in which a dual system is employed, the magneto is there as the system to run on, the "coil" being placed for emergency purposes. Were magnetos lower priced, they would be employed to the exclusion of coils on the systems using but one source of energy, provided motors could be started on the magneto, which does not seem to be impossible. On the other hand, the coil systems have improved so much that they are thoroughly capable under all the conditions in which it is not necessary to squeeze the last drop of power out of the motor. Many of the smaller cars are fitted with coils, and in some cases "master vibrator" systems are used. In some instances the magneto is used in conjunction with a battery, both



Steering Linkages of Great Strength.

went the rounds bering upon the question of the availability of alcohol. Carbureters are water-jacketed to a considerable extent, the idea being to run the hot water from the exhaust into the jacket of the carbureter to absorb the latent heat in the fuel that manifests itself during the period of evaporation, retarding the rate of evaporation. In some cases, as formerly, hot air is used. In only one or two instances is the formality dispensed with. Automatic carbureters have not made the headway that was promised for them and the auxiliary air supply is still with us. There is some evidence of what may be called "carbureter complication," but it is quite limited, and of justification there may be ample; one cannot tell at the show. Gasoline tanks are of liberal size, which, however, is not a compliment. The tanks are very well made, and the piping is quite healthy in most cases, with here and there a car in which so much is given at the price that the piping shows evidence of "skimping."

Lighting Systems.—Gas tanks are as thick as fleas on a dog's back, and they vie with the generators for supremacy. Let it not be supposed, however, that they are having it their own way. Generators are to be seen in great numbers, and they are not all on the low-priced cars. In other words, it is an even break, with little chance of either system falling far below the high estate they now lay claim to. Piping

as the source of energy, and a "step-up transformer" is employed in common between them. In any event, with ample motors and light cars rolling on wheels of big diameter, it would seem as if the ignition question is quite well settled.

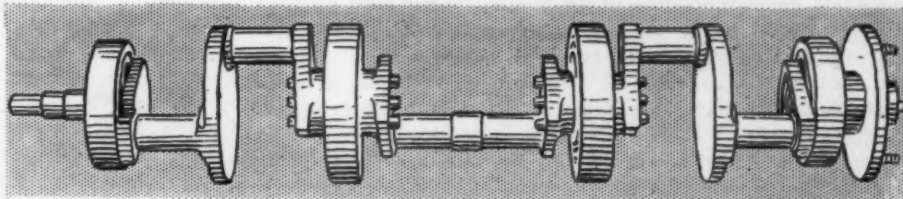
Fuel Systems.

Gasoline is still the liquid fuel, in spite of all the talk that

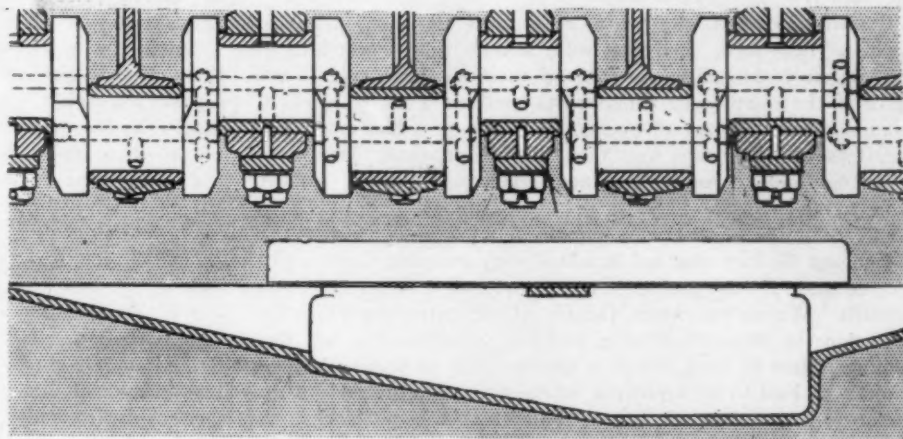
that they are quite so good as die-forged steel, which can be rendered as brass if they are "roll-plated," as they are in the fine examples to be seen. The oil lamps that look like "hearse lights" (as some wag put it) do cut a shine, and in the nighttime they keep it up. The question of electric lighting is one that we have not heard the last of. This method of lighting is forging to the fore, and it has a legitimate zone. Batteries are now so good that to use them for lighting, as well as the ignition system, is the natural thing to do. It is being done.

Tops and Windshields.—In the touring car class, "cape tops" are much in vogue, and they have reached a high state of development. They, with windshields and curtains, go a long way toward rendering touring under inclement conditions of weather less to be dreaded than ever before. The windshields have more of the "dodger" principle than formerly, and they do not rattle. The tops are not only in good style, but they are well made; broken bows should be of the past.

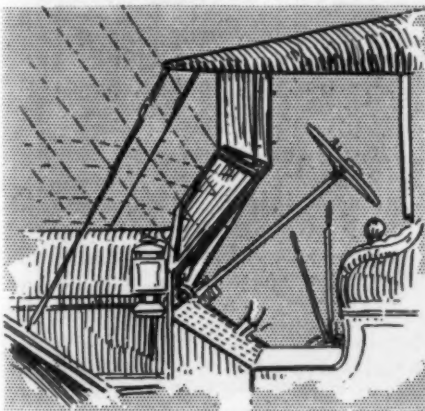
Underpans.—If it is desirable to protect the autoist from the ills of inclement weather, it is equally desirable to keep mud accumulations from the motor and the rest of the power plant.



Ball Bearing Crankshaft that Is Used on the Mora.



Method of Oiling Crankshaft and Sump to Prevent Splash.

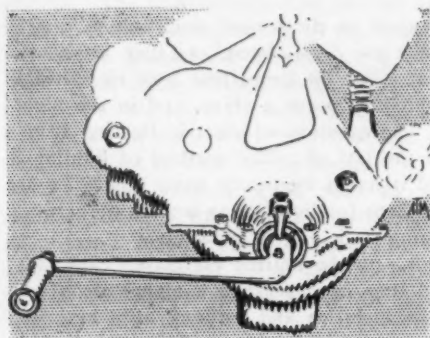


Clear Vision Windshield on Gaeth.

Of the lamps, too much cannot be said for them. They are in fine taste, there is a wide range to choose from, and for lighting (which is what they are there for) it is believed they are more capable than they ever were before. On the low-priced cars, die-forged (steel) brackets are used: they are capable, but it cannot be said of the cast bronze kind

This is looked after in a fitting manner, and the mud aprons (pans) are not only capable but they are easy to drop down, in order to be able to get at the machinery in the event necessity dictates. In this connection, it may not be out of place to call attention to the year's offerings by way of adequate mudguards, which is a matter that was never before on a fitting basis. As it is, the mudguards extend down to the chassis (frame) and the amount of protection they thus afford is only equalled by their neat appearance. The fellow that invented the "flaring mudguard" was helped enormously by the other fellow that added the mud drip, but the idea of extending the mudguards down to the chassis (frame) was the one that capped the climax.

Noise and Lubrication.—Both subjects will be treated in common, on the ground that in the absence of one, the other will render itself manifest. The absence of oil will at first show by a squeak. In the long run the squeak will propagate a rattle. Lubrication, then, is important, and it is pointed out that no amount of oil in the crankcase, for illustration, will be of avail when it comes to preventing rattle in the multitudinous small parts and in and about the chassis. If oil cannot be used, a



Means for Holding Starting Crank.

part, for in about every case the oiling question has been treated seriously. The systems are not all the same; all the designers did not reach exactly the same conclusions; but they all seemed to be alive to the facts, and all made a stagger at a solution of the problem, to say the least. It was a good stagger, too; the end was a complete solution of the problem in the great majority of cases. It is nice to see universal joints protected from dirt and oiled. This year's cars are nice in this respect. Grease cups are used to a large extent. Grease may now be had in which the lubricating qualities are equal to the same qualities in any fine lubrication oil. A clean dash is in style; this comes through the use of force feed oilers, aided by the fact that magnetos are used for the ignition systems. A couple of tell-tales and a coil are all to be seen on the dash these days; not always the coil, for the same is oftentimes placed elsewhere, with the idea of keeping the dash free of incumbrances.

Cooling Systems.—Radiators are in several styles, as honeycomb, vertical tube, horizontal tube, and flat plate, or plates of thin copper fashioned in imitation of the honeycomb type. Then there is the round tube radiator, as used on some of the fine examples of cars. At all events, it is to note a fine display of radiators, and of pumps for the circulation of water there is the centrifugal and the gear pump, not forgetting some flat "paddle" types to boot. In notable instances the thermo-syphon principle is used, and on the whole the cooling question is handled so that few indeed are the cars that are troubled with steaming radiators or hot motors. Of the piping, it is assured that a better condition prevails. Within the water jackets of the cylinders much has been done to eliminate trouble, and it is a noteworthy fact that cooling is less in need, which is another way of saying that the amount of heat to be wiped out of the water is reduced and the radiators have less work to do, hence the tendency to steam is reduced. The improvement, then, has been in two directions.

Harmony of Relation.—Considering the power of the motors and the weights of the cars, it is to note that harmony resides in the 1909 products as it never before made bold to proclaim itself. This is a detail that was not taken account of to any great extent until recent times, and when designers awakened to the seriousness of the question it is fair of them to say they allowed no grass to grow under their feet. In many cases, this same harmony was a natural conclusion, but some of the overpowered

grease cup can. If the parts are coated with oil or grease, "grit" will be warded off, and noise will not creep in. If a squeak is an indication of a dry surface, rattle tells of the fact that the squeak fell on dull ears. At all events, it cannot now be said of the builders of cars that they failed to do their

ucts were very weak indeed. Thanks to experience and opportunity, this matter has been taken care of.

Attention to Details.—In divers ways the details that formerly gave trouble in the long run, if not very early in the process, are reduced to a sane basis. The earlier failures were, in a large measure, due to a desire to inflict something distinctive on the user of cars, perhaps passing by devices that were known to be good for the purpose. Take, for illustration, timers: they should be stable and electrically suited to the exacting service required of them; they are as they obtain on the cars at the show as they never were before, due to a better understanding of the requirements in the hands of men of skill. Consider, for instance, the question of the lubrication of the timer; how many

examples of no provision to be found in old models will never be known, while in the work of the year this question has been worked out to a nicety. Now the hard lubricants available are dependable if they are purchased of the companies that make a specialty of this class of trade and who know the needs as they now exist.

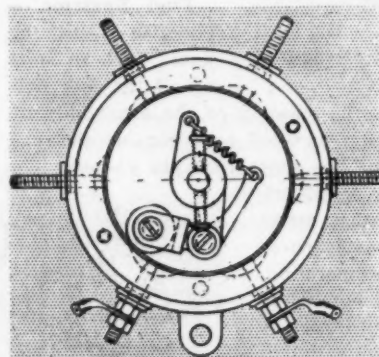
Cost of Maintenance.

—The time was when the cost of maintenance of an automobile was regarded as a bar to the ownership of a car at any price because the purchase price was, as some said, the easiest part of it. This matter was disposed of to a large extent in the earlier examples of the better makes of cars, but the 1909 products are quite generally to be included in the list of the cars with a low cost of maintenance. The reason for this lies in the fact that the vendors of materials, knowing the wants of one, have the same information to give to all; and it takes but a little time in connection with a matter of this sort to level the situation. The

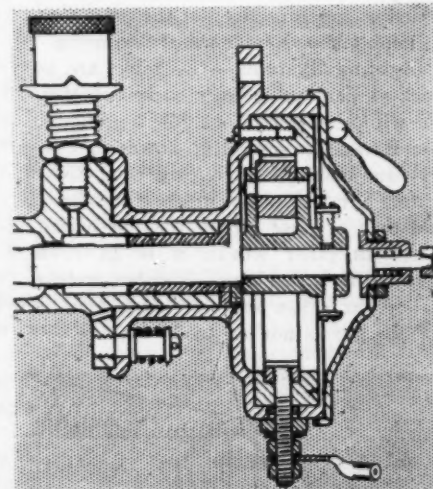
cost of maintenance should be very low, indeed, in view of the standardized condition of the industry, and in further view of the general use of suitable materials, such as found their way into but few of the automobiles at first on account of the high cost, a question now disposed of by mere force of quantity.

Absence of Complication.

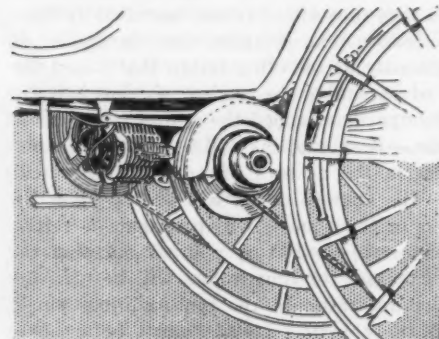
—Users of cars soon learn how to control automobiles if such are mechanically as simple as can be. The time was when numerous mysterious trinkets were dangled from supports all through the then "half-baked" products, but the designers of acumen soon learned how to do without such useless complications, and they stayed at it until they had done away with the devices that lent zest to the efforts of "astronomers" who crawled under cars, thereafter to gaze towards the canopy of Heaven through a dark and dismal aggregation of levers and other things that intercepted the line of vision. As it is, there is no reason for going under a car, even if some part does need a little attention. It can be reached from the side.



Roller Contact, Spring Tension Timer.



Good Lubrication on Timer and Bearing.



Holsman Method of Cable Drive.

cars were the sufferers, as were the runabout types that sported touring bodies in the early days. The time was when to note a body that weighed more than the chassis was as common as it is scarce to-day. If a chain is as strong as its weakest link, it is assured that some of the earlier prod-



THE AUTOMOBILE CALENDAR for 1909

JANUARY 1909						
Sun	Mon	Tue	Wed	Thu	Fri	Sat
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30
31						

DEC. 31-JAN. 7.....New York City, Grand Central Palace, A. M. C. M. A. Show.	FEB. 15-20.....Detroit, Detroit A. D. A. Show.
JAN. 8.....New York City, Fourth Annual Meeting Society of Automobile Engineers	FEB. 15-20.....Cleveland, Cleveland A. D. C. Show.
JAN. 16-25.....New York City, Madison Square Garden, A. L. A. M. Show.	FEB. 16-18.....Denver, Denver M. C. Show.
JAN. 27-FEB. 3.....Philadelphia, Second Regiment Armory, Philadelphia A. T. A. Show.	FEB. 18-25.....Toronto, Ont. Annual Show.
FEB. 6-13.....Chicago, Coliseum-1st Regt. Armory, N. A. A. M. Show.	FEB. 20-27.....Newark, N. J., New Jersey A. T. A. Show.
FEB. 17-20.....St. Louis, St. Louis A. M. A. Show.	FEB. 20-27.....Hartford, Conn., Hartford A. D. A. Show.
	MAR. 1-6.....Buffalo, Buffalo A. D. A. Show.
	MAR. 6-13.....Boston, Boston A. D. A. Show.
	MAR. 15-20.....Rochester, N. Y., Rochester A. D. A. Show.
	MAR. 27-Apr. 3.....Pittsburg, Pittsburg A. D. A. Show.

FEBRUARY 1909						
Sun	Mon	Tue	Wed	Thu	Fri	Sat
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29						

MARCH 1909						
Sun	Mon	Tue	Wed	Thu	Fri	Sat
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31				

APRIL 1909						
Sun	Mon	Tue	Wed	Thu	Fri	Sat
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30					

MAY 1909						
Sun	Mon	Tue	Wed	Thu	Fri	Sat
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31				

JUNE 1909						
Sun	Mon	Tue	Wed	Thu	Fri	Sat
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30					

JULY 1909						
Sun	Mon	Tue	Wed	Thu	Fri	Sat
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31				

AUGUST 1909						
Sun	Mon	Tue	Wed	Thu	Fri	Sat
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31				

SEPTEMBER 1909						
Sun	Mon	Tue	Wed	Thu	Fri	Sat
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30					

OCTOBER 1909						
Sun	Mon	Tue	Wed	Thu	Fri	Sat
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30					

NOVEMBER 1909						
Sun	Mon	Tue	Wed	Thu	Fri	Sat
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30					

DECEMBER 1909						
Sun	Mon	Tue	Wed	Thu	Fri	Sat
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31				

MAKE AND MODEL	Price	BODY		MOTOR		COOLING		IGNITION		Lubrication	Clutch	TRANSMISSION			CONTROL		WHEEL		Frame	BEARINGS		Axle	Weight	TIRES	
		Type	Seats	Cylinders	Bore	Stroke	Radiator	Pump	IGNITION			Speeds	Drive	Brakes	Steering	Base	Track	Motor		Transmis- sion					
									Magneto												Battery				
CAR COSTING \$1,000 OR LESS																									
REO—"G"	\$500	10	Runabout	2	1	4 1/2	4 1/2	Tubular	Gear	Dry	Pump	Disc	Planetary	2	Chain	2	Worm & Sector	78 5/8	Pressed Steel				28x3	28x3	
MAXWELL—"A"	500	10	Runabout	2	2	4	4	H'comb	Thermo	Dry	Dry	Disc	Planetary	2	Chain	2	Worm & Sector	82 5/8	Pressed Steel				28x3	28x3	
BRUSH—"B"	550	7	Runabout	2	1	4	4	Thermo	Thermo	Dry	Dry	Disc	Planetary	2	Chain	2	Worm & Sector	74 5/8	Wood				900	28x3	
BRUSH—"B"	550	7	Runabout	2	1	4	4	Thermo	Thermo	Dry	Dry	Disc	Planetary	2	Chain	2	Worm & Sector	74 5/8	Wood				900	32x3	
ANDERSON—"C"	650	12	Runabout	2	2	4	4 1/2	Air	Air	Dry	Forcefeed	Disc	Planetary	3	Chain	2	Worm	70 5/8			Roller		900	30x3	
GYROSCOPE	750	16	Optional	2	2	4 1/2	4 1/2	H'comb	Thermo	Dry	Forcefeed	Disc	Planetary	3	Chain	2	Worm	95 5/8	Pressed Steel		Roller & Ball	Roller & Ball	1,500	30x3	
LAMBERT—"A-1"	800	20	Runabout	2	2	5	5	H'comb	Thermo	Dry	Forcefeed	Disc	Planetary	3	Chain	2	Worm	95 5/8	Pressed Steel		Roller & Ball	Roller & Ball	1,500	30x3	
GYROSCOPE	800	16	Roadster	2	2	4 1/2	4 1/2	H'comb	Thermo	Dry	Forcefeed	Disc	Planetary	3	Chain	2	Worm	95 5/8	Pressed Steel		Roller & Ball	Roller & Ball	1,500	30x3	
MAXWELL—"L-B"	850	14	Runabout	2	2	4 1/2	4 1/2	H'comb	Thermo	Dry	Storage	Mul. Disc	Planetary	3	Chain	2	Worm & Sector	84 5/8	Pressed Steel				1,150	30x3	
FORD—"T"	850	20	Touring	2	4	4 1/2	4 1/2	H'comb	Thermo	Dry	Magneto	Magneto	Planetary	3	Chain	2	Worm & Sector	100 5/8	Pressed Steel				1,200	30x3	
JACKSON—"F"	850	16-18	Runabout	2	2	4 1/2	4 1/2	H'comb	Thermo	Dry	Dry	Mul. Disc	Planetary	3	Chain	2	Worm & Sector	96 5/8	Pressed Steel				1,600	30x3	
JACKSON—"F"	850	16-18	Runabout	2	2	4 1/2	4 1/2	H'comb	Thermo	Dry	Dry	Mul. Disc	Planetary	3	Chain	2	Worm & Sector	96 5/8	Pressed Steel				1,600	30x3	
MIDDLEBY—"A or B"	850	25	Optional	2 or 4	4	4	4	Air	Air	Dry	Forcefeed	Cone	Progressive	3	Chain	2	Irreversible	108 5/8	Armored W'd		White Br.	White Br.	1,750	32x3	
LAMBERT—"A-3"	875	20	Runabout	4	2	5	5	H'comb	Thermo	Dry	Dry	Disc	Planetary	3	Chain	2	Worm & Nut	95 5/8	Pressed Steel				1,400	30x3	
CAMERON—"14"	900	20-24	Runabout	2	4	3 1/2	3 1/2	Air	Air	Dry	Gear	Int. Cone	Selective	3	Chain	2	Worm & Nut	96 5/8	Steel		P. White Br.	P. White Br.	1,200	30x3	
FORD—"T"	950	20	Coupe	3	4	3 1/2	3 1/2	Air	Centrifl.	Dry	Gear	Mul. Disc	Planetary	3	Chain	2	Worm & Nut	100 5/8	Pressed Steel		P. White Br.	P. White Br.	1,200	30x3	
CAMERON—"14"	950	20-24	Roadster	3	4	3 1/2	3 1/2	Air	Centrifl.	Dry	Gear	Mul. Disc	Planetary	3	Chain	2	Worm & Nut	96 5/8	Steel		P. White Br.	P. White Br.	1,225	30x3	
CAMERON—"15"	1000	20-24	Runabout	2	4	3 1/2	3 1/2	Air	Air	Dry	Gear	Int. Cone	Selective	3	Chain	2	Worm & Nut	92 5/8	Steel		P. White Br.	P. White Br.	1,100	32x3	
MITCHELL—"J"	1000	20	Runabout	2	4	4	4	Collular	Gear	Dry	Gear	Int. Cone	Selective	3	Chain	2	Worm & Nut	92 5/8	Pressed Steel				1,700	32x3	
REO—"H-R"	1000	20-22	Runabout	2	4	4	4	Tubular	Gear	Dry	Storage	Mul. Disc	Planetary	3	Chain	2	Worm & Sector	96 5/8	Pressed Steel				32x3	32x3	
CARTER—"H"	1000	20-22	Runabout	2	4	4	4	Tubular	Gear	Dry	Storage	Mul. Disc	Planetary	3	Chain	2	Worm & Sector	96 5/8	Pressed Steel				32x3	32x3	
FORD—"T"	1000	20	Town Car	2	4	4	4	Tubular	Thermo	Dry	Magneto	Magneto	Planetary	3	Chain	2	Worm & Sector	100 5/8	Pressed Steel				1,400	30x3	
FORD—"T"	1000	20	Town Car	2	4	4	4	Tubular	Thermo	Dry	Magneto	Magneto	Planetary	3	Chain	2	Worm & Sector	100 5/8	Pressed Steel				1,400	30x3	
FORD—"T"	1000	20	Town Car	2	4	4	4	Tubular	Thermo	Dry	Magneto	Magneto	Planetary	3	Chain	2	Worm & Sector	100 5/8	Pressed Steel				1,400	30x3	
FORD—"T"	1000	20	Town Car	2	4	4	4	Tubular	Thermo	Dry	Magneto	Magneto	Planetary	3	Chain	2	Worm & Sector	100 5/8	Pressed Steel				1,400	30x3	
FORD—"T"	1000	20	Town Car	2	4	4	4	Tubular	Thermo	Dry	Magneto	Magneto	Planetary	3	Chain	2	Worm & Sector	100 5/8	Pressed Steel				1,400	30x3	
FORD—"T"	1000	20	Town Car	2	4	4	4	Tubular	Thermo	Dry	Magneto	Magneto	Planetary	3	Chain	2	Worm & Sector	100 5/8	Pressed Steel				1,400	30x3	
FORD—"T"	1000	20	Town Car	2	4	4	4	Tubular	Thermo	Dry	Magneto	Magneto	Planetary	3	Chain	2	Worm & Sector	100 5/8	Pressed Steel				1,400	30x3	
FORD—"T"	1000	20	Town Car	2	4	4	4	Tubular	Thermo	Dry	Magneto	Magneto	Planetary	3	Chain	2	Worm & Sector	100 5/8	Pressed Steel				1,400	30x3	
FORD—"T"	1000	20	Town Car	2	4	4	4	Tubular	Thermo	Dry	Magneto	Magneto	Planetary	3	Chain	2	Worm & Sector	100 5/8	Pressed Steel				1,400	30x3	
FORD—"T"	1000	20	Town Car	2	4	4	4	Tubular	Thermo	Dry	Magneto	Magneto	Planetary	3	Chain	2	Worm & Sector	100 5/8	Pressed Steel				1,400	30x3	
FORD—"T"	1000	20	Town Car	2	4	4	4	Tubular	Thermo	Dry	Magneto	Magneto	Planetary	3	Chain	2	Worm & Sector	100 5/8	Pressed Steel				1,400	30x3	
FORD—"T"	1000	20	Town Car	2	4	4	4	Tubular	Thermo	Dry	Magneto	Magneto	Planetary	3	Chain	2	Worm & Sector	100 5/8	Pressed Steel				1,400	30x3	
FORD—"T"	1000	20	Town Car	2	4	4	4	Tubular	Thermo	Dry	Magneto	Magneto	Planetary	3	Chain	2	Worm & Sector	100 5/8	Pressed Steel				1,400	30x3	
FORD—"T"	1000	20	Town Car	2	4	4	4	Tubular	Thermo	Dry	Magneto	Magneto	Planetary	3	Chain	2	Worm & Sector	100 5/8	Pressed Steel				1,400	30x3	
FORD—"T"	1000	20	Town Car	2	4	4	4	Tubular	Thermo	Dry	Magneto	Magneto	Planetary	3	Chain	2	Worm & Sector	100 5/8	Pressed Steel				1,400	30x3	
FORD—"T"	1000	20	Town Car	2	4	4	4	Tubular	Thermo	Dry	Magneto	Magneto	Planetary	3	Chain	2	Worm & Sector	100 5/8	Pressed Steel				1,400	30x3	
FORD—"T"	1000	20	Town Car	2	4	4	4	Tubular	Thermo	Dry	Magneto	Magneto	Planetary	3	Chain	2	Worm & Sector	100 5/8	Pressed Steel				1,400	30x3	
FORD—"T"	1000	20	Town Car	2	4	4	4	Tubular	Thermo	Dry	Magneto	Magneto	Planetary	3	Chain	2	Worm & Sector	100 5/8	Pressed Steel				1,400	30x3	
FORD—"T"	1000	20	Town Car	2	4	4	4	Tubular	Thermo	Dry	Magneto	Magneto	Planetary	3	Chain	2	Worm & Sector	100 5/8	Pressed Steel				1,400	30x3	
FORD—"T"	1000	20	Town Car	2	4	4	4	Tubular	Thermo	Dry	Magneto	Magneto	Planetary	3	Chain	2	Worm & Sector	100 5/8	Pressed Steel				1,400	30x3	
FORD—"T"	1000	20	Town Car	2	4	4	4	Tubular	Thermo	Dry	Magneto	Magneto	Planetary	3	Chain	2	Worm & Sector	100 5/8	Pressed Steel				1,400	30x3	
FORD—"T"	1000	20	Town Car	2	4	4	4	Tubular	Thermo	Dry	Magneto	Magneto	Planetary	3	Chain	2	Worm & Sector	100 5/8	Pressed Steel				1,400	30x3	
FORD—"T"	1000	20	Town Car	2	4	4	4	Tubular	Thermo	Dry	Magneto	Magneto	Planetary	3	Chain	2	Worm & Sector	100 5/8	Pressed Steel				1,400	30x3	
FORD—"T"	1000	20	Town Car	2	4	4	4	Tubular	Thermo	Dry	Magneto	Magneto	Planetary	3	Chain	2	Worm & Sector	100 5/8	Pressed Steel				1,400	30x3	
FORD—"T"	1000	20	Town Car	2	4	4	4	Tubular	Thermo	Dry	Magneto	Magneto	Planetary	3	Chain	2	Worm & Sector	100 5/8	Pressed Steel				1,400	30x3	
FORD—"T"	1000	20	Town Car	2	4	4	4	Tubular	Thermo	Dry	Magneto	Magneto	Planetary	3	Chain	2	Worm & Sector	100 5/8	Pressed Steel				1,400	30x3	
FORD—"T"	1000	20	Town Car	2	4	4	4	Tubular	Thermo	Dry	Magneto	Magneto	Planetary	3	Chain	2	Worm & Sector	100 5/8	Pressed Steel				1,400	30x3	
FORD—"T"	1000	20	Town Car	2	4	4	4	Tubular	Thermo	Dry	Magneto	Magneto	Planetary	3	Chain	2	Worm & Sector	100 5/8	Pressed Steel				1,400	30x3	
FORD—"T"	1000	20	Town Car	2	4	4	4	Tubular	Thermo	Dry	Magneto	Magneto	Planetary	3	Chain	2	Worm & Sector	100 5/8	Pressed Steel				1,400	30x3	
FORD—"T"	1000	20	Town Car	2	4	4	4	Tubular	Thermo	Dry	Magneto	Magneto	Planetary	3	Chain	2	Worm & Sector	100 5/8	Pressed Steel				1,400	30x3	
FORD—"T"	1000	20	Town Car	2	4	4	4	Tubular	Thermo	Dry	Magneto	Magneto	Planetary	3	Chain	2	Worm & Sector	100 5/8	Pressed Steel				1,400	30x3	
FORD—"T"	1000	20	Town Car	2	4	4	4	Tubular	Thermo																

CARS COSTING BETWEEN \$1,500 AND \$2,000

2	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

CARS COSTING BETWEEN \$2,000 AND \$3,000

PENNSYLVANIA-D-25	\$2100	28.9	Runabout	4	4	4 1/2	4 1/2	44	44	H'comb.	Magneto.	Magneto.	Storage.	Mech.	Cone.	Selective.	3 Shaft.	4	Worm & Sector.	110	56 1/2	Pressed Steel.				2,350	32x4	32x4
PENNSYLVANIA-D-25	2100	28.9	Touring	4	4	4 1/2	4 1/2	44	44	H'comb.	Magneto.	Magneto.	Storage.	Mech.	Cone.	Selective.	3 Shaft.	4	Worm & Sector.	110	56 1/2	Pressed Steel.				2,400	32x4	32x4
McCUE	2200	30	Touring	5	4	4 1/2	4 1/2	44	44		Magneto.	Dry.	Dry.		Cone.	Selective.	3 Shaft.	4	Worm.	116	56	Pressed Steel.	Plain.	Ball.		2,200	36x4	36x4
MIDLAND-G	2250	30-35	Optional.	5	4	4 1/2	4 1/2	44	44	Tubular.	Magneto.	Dry.	Dry.		Mul. Disc.	Selective.	3 Shaft.	4	Screw & Nut.	112	56	Pressed Steel.				2,650	34x4	34x4
KISSEL KAR-D-9	2300	40	Close C'pled.	4	4	4 1/2	4 1/2	44	44	Tubular.	Gear.	Remy.	Storage.	Mech.	Cone.	Selective.	1 Shaft.	4	Worm & Sector.	115	56	Steel.	White Metal.	Timken.		2,300	36x3 1/2	36x4
MARMON-32	2400	32-40	Runabout.	4	4	4 1/2	4 1/2	44	44	Cellular.	H. T. Mag.	H. T. Mag.	Storage.		Expanding	Selective.	3 Shaft.	4	Screw & Nut.	112	56	Pressed Steel.				1,975	34x3 1/2	34x3 1/2
MARMON-32	2400	32-40	Runabout.	4	4	4 1/2	4 1/2	44	44	Cellular.	H. T. Mag.	H. T. Mag.	Storage.		Expanding	Selective.	3 Shaft.	4	Screw & Nut.	112	56	Pressed Steel.				1,975	34x3 1/2	34x3 1/2
COATES-GOSHEN-25	2450	25	Runabout.	4	4	4	4	44	44	Cellular.	Gear.	Bosch.	Storage.	Splash.	Cone.	Selective.	3 Shaft.	4	Double Screw.	112	56 1/2	Pressed Steel.	Plain.	H-B.		2,200	36x3 1/2	36x3 1/2
PREMIER-30	2500	30-35	Runabout.	4	4	4 1/2	4 1/2	44	44	Cellular.			Storage.		Mul. Disc.	Selective.	3 Shaft.	4	Worm & Nut.	114	56 1/2	Pressed Steel.				2,600	34x3 1/2	34x4
PREMIER-30	2500	30-35	Touring.	4	4	4 1/2	4 1/2	44	44	Cellular.			Storage.		Mul. Disc.	Selective.	3 Shaft.	4	Worm & Nut.	120	56 1/2	Pressed Steel.				2,700	34x4	34x4
STODDARD-D-9-K	2500	45	Runabout.	5	4	4 1/2	4 1/2	44	44	Cellular.	Magneto.	Magneto.	Storage.		Cone.	Selective.	3 Shaft.	4	Worm & Nut.	113 1/2	56 1/2	Pressed Steel.				3,000	34x4	34x4
ACME-XIX	2500	25	Runabout	7	4	4 1/2	4 1/2	44	44	5	Tubular.	Magneto.	Storage.		Cone.	Selective.	3 Shaft.	4	Screw & Nut.	96	56	Pressed Steel.				3,454	34x4	34x4
ATLAS (Two Cycle)-T	2500	22	Town Car.	2	4	4 1/2	4 1/2	44	44	Cellular.			Dry.		Cont. Band Sliding.		3 Shaft.	4	Irreversible	100	56	P. S. or Wood.				2,500	30x4	30x4
SPEEDWELL-M-C	2500	40	Roadster.	5	4	4 1/2	4 1/2	44	44	H'comb.	Bosch.	Bosch.	Storage.	Splash.	Cone.	Selective.	3 Shaft.	4	Worm & Gear.	120	56	Pressed Steel.	P. White Br.	Timken.		2,400	34x4	34x4
SPEEDWELL-M-D	2500	40	Touring.	7	4	4 1/2	4 1/2	44	44	5	H'comb.	Bosch.	Dry.	Splash.	Cone.	Selective.	3 Shaft.	4	Worm & Gear.	120	56	Pressed Steel.	P. White Br.	Timken.		2,700	34x4	34x4
KISSEL KAR-G-9	2750	60	Roadster.	6	4	4 1/2	4 1/2	44	44	Tubular.	Centrifl.	Bosch.	Dry.	Mech.	Cone.	Selective.	3 Shaft.	4	Worm & Sector.	130	56	Steel.	White Metal.	Timken.		3,100	36x4	36x4 1/2
KISSEL KAR-G-9	2750	60	Baby Ton.	6	4	4 1/2	4 1/2	44	44	Tubular.	Centrifl.	Bosch.	Dry.	Mech.	Cone.	Selective.	3 Shaft.	4	Worm & Sector.	130	56	Steel.	White Metal.	Timken.		3,604	36x4	36x4 1/2
KISSEL KAR-G-9	2750	60	Touring.	5	4	4 1/2	4 1/2	44	44	Tubular.	Centrifl.	Bosch.	Dry.	Mech.	Cone.	Selective.	3 Shaft.	4	Worm & Sector.	130	56	Steel.	White Metal.	Timken.		3,604	36x4	36x4 1/2
KISSEL KAR-G-9-35	2750	35	Optional.	5	4	4 1/2	4 1/2	44	44	Spectral.	Gear.	Bosch.	Storage.		Cone.	Selective.	3 Shaft.	4	Worm Gear.	115	56 1/2	Pressed Steel.				2,600	34x4	34x4
MORA-Tanglefoot	2750	30	Runabout.	4	4	4 1/2	4 1/2	44	44	5	Tubular.	Magneto.	Storage.		Cone.	Selective.	3 Shaft.	4	Worm & Nut.	118	56	Pressed Steel.				2,700	34x4	34x4
MORA-Tanglefoot	2750	30	Runabout.	4	4	4 1/2	4 1/2	44	44	5	Tubular.	Magneto.	Storage.		Cone.	Selective.	3 Shaft.	4	Worm & Nut.	118	56	Pressed Steel.				2,700	34x4	34x4
PULLMAN-40	2750	30	Runabout.	4	4	4 1/2	4 1/2	44	44	5	Tubular.	Magneto.	Storage.		Cone.	Selective.	3 Shaft.	4	Irreversible.	124	56	Pressed Steel.				1,900	34x3 1/2	34x3 1/2
GRABLESS-50	2750	50	Touring.	4	5	5 1/2	5 1/2	44	44	H'comb.	Magneto.	Storage.			Cont. Ring.	Gearless	2	3		124	56	Pressed Steel.				3,604	36x4	36x4 1/2

CARS COSTING BETWEEN \$2,000 AND \$3,000—Continued

MAKE AND MODEL	Price	H.P.	Type	Seats	Bore	Stroke	Radiator	Cooling	Ignition	Lubrication	Clutch	TRANSMISSION			Control	WHEEL		BEARINGS		Weight	TIRES	
												Speeds	Drive	Brakes		Base	Track	Frame	Motor		Front	Rear
LANE (Steamer)—16	\$2800	30	Roadster	3	2	4 1/2	44 Tubular	Gear	Magneto	Splash	Mul. Disc.	Chain	3	4	Irreversible	112	56	Steel	Roller	3,100	36x4	36x4
AUSTIN—45	2850	45	Runabout	3	4	4 1/2	44 Tubular	Gear	Magneto	Splash	Mul. Disc.	3 Shaft	4	4	Worm & Sector	122	54 1/2	Alloy Steel	Plain	2,250	36x3 1/2	36x3 1/2
COATES-GOSHEN—32	2850	32	Runabout	4	4	4 1/2	44 Tubular	Gear	Bosch	Splash	Cone	3 Shaft	4	4	Double Screw	116	56 1/2	Pressed Steel	Plain	2,450	36x4	36x4
PULLMAN—40	3000	40	Runabout	3	4	5 1/2	44 Tubular	Gear	Bosch	Storage	Mul. Disc.	3 Shaft	4	4	Irreversible	106	56	Pressed Steel	Plain	2,300	36x4	36x4
AUSTIN—45	3000	45	Touring	3	4	4 1/2	44 Tubular	Gear	Bosch	Storage	Mul. Disc.	3 Shaft	4	4	Worm & Sector	122	54 1/2	Pressed Steel	Plain	2,300	36x3 1/2	36x3 1/2
SULTAN	3000	10-12	Landulet	6	4	4 1/2	44 Tubular	Gear	Bosch	Storage	Mul. Disc.	3 Shaft	4	4	Worm & Sector	122	54 1/2	Pressed Steel	Plain	2,400	32x4	32x4
PENNSYLVANIA—C	3000	36	Runabout	5	4	4 1/2	44 Tubular	Gear	Bosch	Storage	Mul. Disc.	3 Shaft	4	4	Worm & Nut	114	56 1/2	Pressed Steel	Plain	2,400	32x4	32x4
PENNSYLVANIA—C	3000	36	Touring	5	4	4 1/2	44 Tubular	Gear	Bosch	Storage	Mul. Disc.	3 Shaft	4	4	Worm & Nut	114	56 1/2	Pressed Steel	Plain	2,400	32x4	32x4
KISSEL KAR—G-9	3000	60	Touring	7	4	4 1/2	44 Tubular	Gear	Bosch	Storage	Mul. Disc.	3 Shaft	4	4	Worm & Sector	122	56	Pressed Steel	White Metal	3,100	36x4	36x4
MOON—C	3000	30-35	Runabout	4	4	4 1/2	44 Tubular	Gear	Bosch	Storage	Mul. Disc.	3 Shaft	4	4	Double Worm	112	56	Pressed Steel	White Br.	2,450	36x3 1/2	36x3 1/2
MOON—C	3000	30-35	Toy Tonneau	4	4	4 1/2	44 Tubular	Gear	Bosch	Storage	Mul. Disc.	3 Shaft	4	4	Double Worm	112	56	Pressed Steel	White Br.	2,500	36x3 1/2	36x3 1/2
COATES-GOSHEN—32	3000	32	Touring	5	4	4 1/2	44 Tubular	Gear	Bosch	Storage	Mul. Disc.	3 Shaft	4	4	Double Worm	112	56	Pressed Steel	White Br.	2,700	36x3 1/2	36x3 1/2
LANE (Steamer)—18	3000	30	Close Coup'd	4	2	4 1/2	44 Tubular	Gear	Bosch	Splash	Cone	3 Shaft	4	4	Double Worm	125	56	Pressed Steel	Roller	3,300	36x4	36x4

CARS COSTING BETWEEN \$3,000 AND \$4,000

LANE (Steamer)—17	\$3100	30	Touring	7	2	4 1/2	Tubular	Gear	Remy	Dry	Splash	Chain	3	4	Worm & Sector	119	56	Steel	Roller	3,400	36x4	36x4 1/2
KISSEL KAR—D-9	3200	40	Limousine	5	4	4 1/2	Tubular	Gear	Bosch	Mech.	Cone	3 Shaft	4	4	Worm & Sector	115	56	Pressed Steel	White Metal	3,100	36x4 1/2	36x4
KISSEL KAR—G-9	3250	60	Coupe	6 1/2	4 1/2	4 1/2	Tubular	Centrifl	Bosch	Mech	Cone	3 Shaft	4	4	Worm & Sector	130	56	Pressed Steel	White Metal	3,100	36x4 1/2	36x4 1/2
COATES-GOSHEN—25	3250	25	Landulet	3-7	6 1/2	4 1/2	H comb	Gear	Bosch	Storage	Cone	3 Shaft	4	4	Double Screw	124	56 1/2	Pressed Steel	H. B.	2,750	36x4 1/2	34x4
MORA—Light Six	3500	42-50	Racetype	3	6	4 1/2	Tubular		Magneto	Storage	Cone	3 Shaft	4	4	Nut & Screw	105	56	Pressed Steel		2,250	36x3 1/2	36x4 1/2
GARTH—XX	3500	38	Close C'pled	5	4 1/2	4 1/2	H comb	Thermo	Magneto	Storage	Cone	3 Shaft	4	4	Irreversible	114	56	Pressed Steel		2,500	36x3 1/2	36x4 1/2
GARTH—XX	3500	38	Touring	4	4 1/2	4 1/2	H comb	Thermo	Magneto	Storage	Cone	3 Shaft	4	4	Irreversible	114	56	Pressed Steel		2,500	36x3 1/2	36x4 1/2
GARTH—XX	3500	38	Touring	4	4 1/2	4 1/2	H comb	Thermo	Magneto	Storage	Cone	3 Shaft	4	4	Irreversible	114	56	Pressed Steel		2,500	36x3 1/2	36x4 1/2
MARMON—45	3500	45	Runabout	4	6	4 1/2	Cellular		H. Mag.	Storage	Cone	3 Shaft	4	4	Screw & Nut	114	56 1/2	Pressed Steel		3,250	36x4 1/2	36x4 1/2
PREMIER—45	3500	45	Runabout	4	6	4 1/2	Cellular		H. Mag.	Storage	Cone	3 Shaft	4	4	Screw & Nut	114	56 1/2	Pressed Steel		3,250	36x4 1/2	36x4 1/2
PREMIER—45	3500	45	Runabout	4	6	4 1/2	Cellular		H. Mag.	Storage	Cone	3 Shaft	4	4	Screw & Nut	114	56 1/2	Pressed Steel		3,250	36x4 1/2	36x4 1/2
PULLMAN—M	3500	40	Touring	7	6 1/2	4 1/2	Tubular		Bosch	Storage	Cone	3 Shaft	4	4	Worm & Nut	124	56 1/2	Pressed Steel		2,900	36x4 1/2	36x4 1/2
ACME—XXVI	3500	40	Touring	7	6 1/2	4 1/2	Tubular		Bosch	Storage	Cone	3 Shaft	4	4	Worm & Nut	124	56 1/2	Pressed Steel		2,900	36x4 1/2	36x4 1/2
ACME—XXVI	3500	30	Touring	5	4 1/2	4 1/2	Tubular		H. T. Mag	Storage	Cone	3 Shaft	4	4	Irreversible	119	56	Pressed Steel		3,000	36x4 1/2	36x4 1/2
ACME—XXVI	3500	30	Touring	5	4 1/2	4 1/2	Tubular		H. T. Mag	Storage	Cone	3 Shaft	4	4	Irreversible	119	56	Pressed Steel		3,000	36x4 1/2	36x4 1/2
SPEDWELL—M-E	3500	40	Limousine	7	4 1/2	4 1/2	Tubular		Bosch	Dry	Cone	3 Shaft	4	4	Screw & Nut	102	56	Pressed Steel	P. White Br.	3,100	36x4 1/2	36x4 1/2
POON—D	3500	30-35	Touring	7	4 1/2	4 1/2	H comb		Magneto	Dry	Cone	3 Shaft	4	4	Worm & Gear	120	56	Pressed Steel	White Br.	3,200	36x4 1/2	36x4 1/2
POON—D	3500	30-35	Touring	7	4 1/2	4 1/2	H comb		Magneto	Storage	Cone	3 Shaft	4	4	Double Worm	121	56	Pressed Steel	White Br.	3,100	36x3 1/2	36x4 1/2

MAKE AND MODEL	BODY		MOTOR		COOLING		IGNITION		Lubrication	CLUTCH		TRANSMISSION			CONTROL		WHEEL		Frame	BEARINGS		Axle	Weight	TIRES	
	H.P.	Type	Seats	Cylinders	Stroke	Radiator	Pump	Magneto				Type	Speeds	Drive	Brakes	Steering	Base	Track						Front	Rear

CARS COSTING BETWEEN \$4,000 AND \$5,000—Continued

DeLUXE	\$5000	50-60 Optional	5 or 7	4	5	5 1/2 Tubular	Centrifl.	Eisemann	Storage	Cone	Disc	Selective	3 Shaft	4 Shaft	4 Worm & Sector	121	56	Alloy Steel	56	Alloy Steel	3,500	36x5	36x5
NATIONAL	5000	50 Touring	7	6	5	5 1/2 Tubular	Centrifl.	Bosch	Storage	Cone	Disc	Selective	3 Shaft	4 Shaft	4 Worm & Sector	121	56	Alloy Steel	56	Alloy Steel	3,850	36x5	36x5
AUSTIN	5000	50 Limousine	7	6	5	5 1/2 Tubular	Centrifl.	H. T. Mag	Storage	Cone	Disc	Sliding	4 Shaft	4 Shaft	4 Rack & Nut	124	56	Pressed Steel	56	Pressed Steel	3,600	36x5	36x5
AUSTIN	5000	50-60 Limousine	7	6	5	5 1/2 Tubular	Centrifl.	Magneto	Storage	Mul. Disc	Disc	Selective	4 Shaft	4 Shaft	4 Worm & Sector	124	56	Alloy Steel	56	Alloy Steel	3,700	36x5	36x5
AUSTIN	5000	50-60 Touring	7	6	5	5 1/2 Tubular	Centrifl.	Magneto	Storage	Mul. Disc	Disc	Selective	4 Shaft	4 Shaft	4 Worm & Sector	124	56	Alloy Steel	56	Alloy Steel	3,800	36x5	36x5
A.M. SIMP X (2 Cycle)—D	5000	50 Limousine	7	4	5	5 1/2 Tubular	Centrifl.	H. T. Mag	Storage	Mul. Disc	Disc	Selective	3 Shaft	4 Shaft	4 Screw	117	56	Pressed Steel	56	Pressed Steel	4,000	36x5	36x5

CARS COSTING ABOVE \$5,000

WELCH	\$5500	50 Optional	7	4	4 1/2	5 H'comb		Bosch	Storage	Mul. Disc	Disc	Selective	3 Shaft	4 Shaft	4 Worm & Sector	125	56	Alloy Steel	56	Alloy Steel	3,800	36x5	36x5
WELCH	5500	50 Limousine	7	4	4 1/2	5 H'comb		Bosch	Storage	Mul. Disc	Disc	Selective	3 Shaft	4 Shaft	4 Worm & Sector	125	56	Alloy Steel	56	Alloy Steel	3,800	36x5	36x5
CHADWICK	5500	60 Touring	Opt'l	6	5	6 H'comb		Bosch	Dry	Expand'g	Disc	Semi-Sel	4 Chains	4 Chains	4 Worm & Sector	135	56	Pressed Steel	56	Pressed Steel	3,400	36x4	36x5
AUSTIN	6000	60-90 Limousine	7	6	5 1/2	5 1/2 Tubular		Magneto	Storage	Disc	Disc	Selective	4 Shaft	4 Shaft	4 Worm & Sector	134	54 1/2	Alloy Steel	54 1/2	Alloy Steel	4,000	36x4 1/2	36x4 1/2
WELCH	6000	75 Optional	7	6	4 1/2	5 H'comb		Bosch	Storage	Mul. Disc	Disc	Selective	3 Shaft	4 Shaft	4 Worm & Sector	138	56	Alloy Steel	56	Alloy Steel	4,000	36x4 1/2	36x4 1/2
WELCH	6000	75 Touring	7	6	4 1/2	5 H'comb		Bosch	Storage	Mul. Disc	Disc	Selective	3 Shaft	4 Shaft	4 Worm & Sector	138	56	Alloy Steel	56	Alloy Steel	4,000	36x4 1/2	36x4 1/2
ACME—XXV	6000	60	7	6	5	5 1/2 Tubular		H. T. Mag	Storage	Cone	Disc	Selective	4 Chains	4 Chains	4 Screw & Nut	120	56 1/2	Pressed Steel	56 1/2	Pressed Steel	3,500	36x4 1/2	36x4 1/2
DeLUXE—C	6250	50-60 Limousine	7	4	5	5 1/2 Tubular		Eisemann	Storage	Cone	Disc	Selective	4 Shaft	4 Shaft	4 Worm & Sector	121	56	Alloy Steel	56	Alloy Steel	3,900	36x5	36x5
CHADWICK	6500	60 Runabout	2	6	5	6 H'comb		Bosch	Dry	Expand'g	Disc	Semi-Sel	4 Chains	4 Chains	4 Worm & Sector	112	56	Pressed Steel	56	Pressed Steel	3,000	36x4	36x4 1/2
WELCH	7000	75 Optional	7	6	4 1/2	5 H'comb		Bosch	Storage	Mul. Disc	Disc	Selective	3 Shaft	4 Shaft	4 Worm & Sector	138	56	Alloy Steel	56	Alloy Steel	4,400	36x5	36x5

HIGH-WHEEL TYPES

BLACK—12 KIBLINGER—H	450 450	14 13.5	Stanhope Runabout	2 2	2 2	4 1/2 4 1/2	Air Air	Air Air	Dry Dry	Mech. Splash	Disc Disc	Planetary Planetary	2 Chain 2 Chain	2 Wheel 2 Wheel	69 69	56 56	Steel Angle	White Metal	Mang. Br.	Plain	890 1,100	38 34x1 1/2	38 34x1 1/2
KIBLINGER—K	475	13.5	Runabout	2	2	4 1/2	Air	Air	Dry	Splash	Disc	Planetary	2 Chains	2 Wheel	69	56	Angle					34x1 1/2	34x1 1/2
KIBLINGER—L	500	13.5	Runabout	3	2	4 1/2	Air	Air	Dry	Splash	Disc	Planetary	2 Chains	2 Wheel	78 1/2	56	Angle					34x1 1/2	34x1 1/2
KIBLINGER—N	550	16	Runabout	3	2	4 1/2	Air	Air	Dry	Splash	Disc	Planetary	2 Chains	2 Wheel	78 1/2	56	Angle					34x1 1/2	34x1 1/2
HOLSMAN—4 ANDERSON—B	550 550	12.8 12	Runabout Runabout	2 2	2 2	4 4 1/2	Air Air	Air Air	Dry Dry	Storage Forefeed	Disc Disc	Friction Planetary	2 Cables 3 Chains	2 Lever 2 Worm	65 70	56 56	Steel Tube Steel			Roller	850	1 1/2	1 1/2
BLACK—115	575	20	Roadster	3	2	4 1/2	Air	Air	Dry	Mech.	Disc	Planetary	2 Chain	2 Wheel	83	56	Steel	White Metal	Mang. Br.	Plain	1,020	36	36
KIBLINGER—NN KIBLINGER—GG	600 600	16 16	Roadster Surrey	3 4	2 2	4 1/2 4 1/2	Air Air	Air Air	Dry Dry	Disc Disc	Disc Disc	Planetary Planetary	2 Chains 2 Chains	2 Wheel 2 Wheel	89 78	56 56	Angle Angle					34x1 1/2	34x1 1/2
BLACK—118 HOLSMAN—5	630 650	20 12.8	Surrey Surrey	4 2	2 2	4 4	Air Air	Air Air	Dry Storage	Mech. Storage	Disc Disc	Planetary Planetary	2 Chain 2 Cables	2 Wheel 2 Lever	78 65	56 56	Steel Steel Tube	White Metal	Mang. Br.	Plain	1,250 845	38 1 1/2	38 1 1/2
KIBLINGER—P	675	16		6	2	4 1/2	Air	Air	Dry		Disc	Planetary	2 Chains	2 Wheel	100	56	Angle					34x1 1/2	34x1 1/2
SCHACHT—K	680	18-20	Corning	2	2	4 1/2	Tubular	Gear	Dry	Mech.		Friction	5 Chain	2 Worm & Sector	74	56		White Br.		Timken	1,100	1 1/2	1 1/2
HOLSMAN—9	700	12.8		2	2	4	Air	Air	Storage				2 Cables	2 Lever	75	56	Steel Tube				930	1 1/2	1 1/2
HOLSMAN—10 KIBLINGER—M	750 750	12.8 27	Stanhope Stanhope	2 3	2 4	4 4 1/2	Air Air	Air Air	Storage Dry	Storage Disc	Disc	Planetary	2 Cables 2 Chains	2 Lever 2 Wheel	75 100	56 56	Steel Tube Angle					940 34x1 1/2	1 1/2 34x1 1/2
HOLSMAN—11	800	12.8	Surrey	4	2	4	Air	Air	Storage				2 Cables	2 Lever	75	56	Steel Tube				1,055	1 1/2	1 1/2
HOLSMAN—H-15	1000	26	Coupe	2	4		Air	Air	Storage			Friction	2 Chains	2 Lever	80	56	Arm'd Wood				1,100	1 1/2	1 1/2
BLACK—40	1250	40	Touring	5	4	4 1/2	Air	Air	Magneto	Dry	Warner	Sliding	3 Shaft	4 Wheel	112	56	Steel	Man. Br.	Roller	Roller	1,750	38x	38x

COMMERCIAL CARS

COSTING \$1,000 OR LESS

KIBLINGER—R...	\$475	13-16 Mail Wagon...	2	2	4 1/2	4 1/2 Air...	Air...	Dry...		Disc...	Disc...	Planetary...	2 Chains...	2 Wheel...	69	56	Angle...	1 1/2	1 1/2
BRUSH...	600	7 Delivery...	1	4	4	H'comb...	Thermo...	Dry...		Mul. Disc...	Mul. Disc...	Planetary...	2 Chains...	2 Wheel...	74	56	Wood...	950	32x2
HOLSMAN—12...	700	12.8 Delivery...	2	4	4	Air...	Air...	Storage...					2 Cable...	2 Lever...	75	56	Steel Tube...	1,060	1 1/2
KIBLINGER—150...	825	16 Delivery...	2	2	4 1/2	4 1/2 Air...	Air...	Dry...		Mul. Disc...	Mul. Disc...	Planetary...	2 Chains...	2 Wheel...	77	56	Angle...	34x1 1/2	34x1 1/2
FORD—T...	950	20 Taxicab...	4	4	4		Centrif'l...	Magneto...		Mul. Disc...	Mul. Disc...	Planetary...	2 Shaft...	3 Irreversible...	100	56	Pressed Steel...	1,350	30x2 3/4

COMMERCIAL CARS—Continued. CARS COSTING BETWEEN \$1,000 AND \$2,000

MAKE AND MODEL	Price	H.P.	Type	Seats	Motor	Cooling	Ignition	Lubrication	Clutch	TRANSMISSION		Control	WHEEL		BEARINGS		Weight	TIRES	
										Type	Gears		Base	Track	Motor	Transmis-		Front	Rear
HART-KRAFT—A-0.	\$1050	14	Chassis.	4	4	4	Splitdorf.	Dry.	Mul. Disc.	Planetary.	2 Chains.	2 Wheel.	90	56	Arm'd Wood.	Bronze.	2,000	36x2	36x2
HART-KRAFT—A-1.	1100	14	Delivery.	4	4	4	Splitdorf.	Dry.	Mul. Disc.	Planetary.	2 Chains.	2 Wheel.	90	56	Arm'd Wood.	Bronze.	2,000	36x2	36x2
HART-KRAFT—A-2.	1175	14	Delivery.	4	4	4	Splitdorf.	Dry.	Mul. Disc.	Planetary.	2 Chains.	2 Wheel.	90	56	Arm'd Wood.	Bronze.	2,000	36x2	36x2
HART-KRAFT—A-3.	1200	14	Delivery.	4	4	4	Splitdorf.	Dry.	Mul. Disc.	Planetary.	2 Chains.	2 Wheel.	90	56	Arm'd Wood.	Bronze.	2,000	36x2	36x2
MAXWELL—O-D.	1400	20	Delivery.	2	4	4	Al. comb.	Storage.	Mul. Disc.	Sliding.	3 Chains.	4 Pinion & Seg.	90	56	Arm'd Wood.	Bronze.	1,700	36x3	36x4
GRABOWSKY—N-Y.	1500	20	Delivery.	4	4	4	Al. comb.	Storage.	Mul. Disc.	Sliding.	3 Chains.	2 Wheel.	102	56	Arm'd Wood.	Bronze.	1,800	36x3	36x4
GRABOWSKY—N-Y.	1500	20	Delivery.	4	4	4	Al. comb.	Storage.	Mul. Disc.	Sliding.	3 Chains.	2 Wheel.	102	56	Arm'd Wood.	Bronze.	1,800	36x3	36x4
LAUSDEN—359.	1850	20	2-Ton.	4	4	4	Centrif.	Storage.	Mul. Disc.	Sliding.	3 Chains.	2 Wheel.	120	52	Wood Arm'd.	Plain.	3,000	24x6	24x6

CARS COSTING BETWEEN \$2,000 AND \$3,000

GRAMM-LOGAN—V.	\$2250	25	1½-Ton.	4	4	4	Al.	Dry.	Forcefeed.	Mul. Disc.	Sliding.	4 Chains.	96	36	Channel.	Bronze.	2,700	34x3	34x3
GRABOWSKY.	2300	25-30	1-Ton.	2	5	5	H. T. Mag.	Storage.	Forcefeed.	Mul. Disc.	Sliding.	3 Chains.	102	56	Pressed Steel.	Bronze.	2,900	34	34
LAUSDEN—36.	2450	25	1-Ton Exp.	4	4	4	Al.	Dry.	Forcefeed.	Mul. Disc.	Sliding.	3 Chains.	88	56	Wood Arm'd.	Plain.	3,000	32x3	32x3
AMERICAN—S.	2500	25	1-Ton.	4	4	4	Centrif.	Storage.	Forcefeed.	Mul. Disc.	Sliding.	3 Chains.	108	56	Arm'd Wood.	Bronze.	2,500	32x3	32x3
PULMAN.	2500	22	Taxicab.	4	4	4	Centrif.	Storage.	Forcefeed.	Mul. Disc.	Sliding.	3 Chains.	102	56	Pressed Steel.	Bronze.	2,200	30x4	30x4
ATLAS (T. Cycle).	2500	22	Taxicab.	4	4	4	Centrif.	Storage.	Forcefeed.	Mul. Disc.	Sliding.	3 Chains.	100	56	Pressed Steel.	Bronze.	2,500	30x4	30x4
SPEEDWELL.	2500	24	Truck.	6	4	4	Centrif.	Storage.	Forcefeed.	Mul. Disc.	Sliding.	3 Chains.	100	56	Pressed Steel.	Bronze.	3,030	34x5	34x5
GRABOWSKY—200-A.	2600	25-30	Bus.	12	2	5	H. T. Mag.	Storage.	Forcefeed.	Mul. Disc.	Sliding.	3 Chains.	102	56	Pressed Steel.	White Br.	2,900	34	34
LAUSDEN—36.	2650	25	1½-Ton.	4	4	4	Al.	Dry.	Forcefeed.	Mul. Disc.	Sliding.	3 Chains.	88	56	Wood Arm'd.	Plain.	3,000	32x3	32x3
AMERICAN—M.	2750	35-40	1½-Ton.	4	4	4	Centrif.	Storage.	Forcefeed.	Mul. Disc.	Sliding.	3 Chains.	112	56	Arm'd Wood.	Bronze.	5,500	36x4	36x5
ROCKWELL.	2750	20	Taxicab.	5	4	4	Centrif.	Storage.	Forcefeed.	Mul. Disc.	Sliding.	3 Chains.	106	53	Steel.	N. D. Ball.	3,254	32x4	32x4
GRABOWSKY—420-A.	2800	25-30	Bus.	2	5	5	H. T. Mag.	Storage.	Forcefeed.	Mul. Disc.	Sliding.	3 Chains.	102	56	Pressed Steel.	Bronze.	2,900	34	34
AMERICAN—E or M.	3000	35-40	2-Ton or 16-P.	4	4	4	Centrif.	Storage.	Forcefeed.	Mul. Disc.	Sliding.	3 Chains.	112	56	Arm'd Wood.	Bronze.	5,500	36x4	36x5
GRABOWSKY.	3000	25-30	Fire or Police.	2	5	5	H. T. Mag.	Storage.	Forcefeed.	Mul. Disc.	Sliding.	3 Chains.	102	56	Pressed Steel.	Bronze.	2,900	34	34

CARS COSTING BETWEEN \$3,000 AND \$4,000

GRABOWSKY—505-A.	\$3050	25-30	2-Ton.	2	5	5	H. T. Mag.	Storage.	Forcefeed.	Mul. Disc.	Sliding.	3 Chains.	127	56	Pressed Steel.	Bronze.	3,400	4	4
GRABOWSKY—600-A.	3100	25-30	Palace.	12	2	5	H. T. Mag.	Storage.	Forcefeed.	Mul. Disc.	Sliding.	3 Chains.	102	56	Pressed Steel.	Bronze.	2,900	34	34
GRAMM-LOGAN—X.	3500	45	3-Ton.	4	4	4	Centrif.	Storage.	Forcefeed.	Mul. Disc.	Sliding.	3 Chains.	120	60	Channel.	Bronze.	5,000	36x5	36x5
MANHATTAN.	3600	50	2-Ton.	4	4	4	Centrif.	Storage.	Forcefeed.	Mul. Disc.	Sliding.	3 Chains.	126	68	Channel.	Bronze.	7,000	36x5	36x5
MANHATTAN.	3750	50	2-Ton.	4	4	4	Centrif.	Storage.	Forcefeed.	Mul. Disc.	Sliding.	3 Chains.	126	68	Channel.	Bronze.	7,000	36x5	36x5
AMERICAN—D.	3800	50	2-Ton.	4	4	4	Centrif.	Storage.	Forcefeed.	Mul. Disc.	Sliding.	3 Chains.	126	68	Channel.	Bronze.	7,000	36x5	36x5
MANHATTAN.	4000	50	3-Ton Chassis.	4	4	4	Centrif.	Storage.	Forcefeed.	Mul. Disc.	Sliding.	3 Chains.	126	68	Channel.	Bronze.	7,000	36x5	36x5

CARS COSTING BETWEEN \$4,000 AND \$5,000

MANHATTAN.	\$4250	50	3-Ton Exp.	4	4	4	Centrif.	Storage.	Forcefeed.	Mul. Disc.	Sliding.	3 Chains.	126	68	Channel.	Bronze.	7,500	36x5	36x5
MANHATTAN.	4350	50	3-Ton Exp.	4	4	4	Centrif.	Storage.	Forcefeed.	Mul. Disc.	Sliding.	3 Chains.	126	68	Channel.	Bronze.	7,500	36x5	36x5
MANHATTAN.	4400	50	3-Ton Wool'n	4	4	4	Centrif.	Storage.	Forcefeed.	Mul. Disc.	Sliding.	3 Chains.	126	68	Channel.	Bronze.	7,500	36x5	36x5
AMERICAN—O.	4500	65	5-Ton.	4	4	4	Centrif.	Storage.	Forcefeed.	Mul. Disc.	Sliding.	3 Chains.	126	68	Channel.	Bronze.	8,500	36x6	36x5
MANHATTAN.	4650	50	4-Ton.	4	4	4	Centrif.	Storage.	Forcefeed.	Mul. Disc.	Sliding.	3 Chains.	127	72	Channel.	Bronze.	8,500	36x5	36x5
MANHATTAN.	4800	50	12-Pass.	4	4	4	Centrif.	Storage.	Forcefeed.	Mul. Disc.	Sliding.	3 Chains.	127	72	Channel.	Bronze.	8,500	36x5	36x5
MANHATTAN.	4800	50	12-Pass.	4	4	4	Centrif.	Storage.	Forcefeed.	Mul. Disc.	Sliding.	3 Chains.	127	72	Channel.	Bronze.	8,500	36x5	36x5
MANHATTAN.	5000	50	20-Pass.	4	4	4	Centrif.	Storage.	Forcefeed.	Mul. Disc.	Sliding.	3 Chains.	127	72	Channel.	Bronze.	8,500	36x5	36x5
MANHATTAN.	5000	50	16-Pass.	4	4	4	Centrif.	Storage.	Forcefeed.	Mul. Disc.	Sliding.	3 Chains.	127	72	Channel.	Bronze.	8,500	36x5	36x5

CARS COSTING OVER \$5,000

MANHATTAN.	\$5100	50	5-Ton.	4	4	4	Centrif.	Storage.	Forcefeed.	Mul. Disc.	Sliding.	3 Chains.	126	72	Channel.	Bronze.	8,800	36x6	36x4
MANHATTAN.	5500	50	20-Pass.	4	4	4	Centrif.	Storage.	Forcefeed.	Mul. Disc.	Sliding.	3 Chains.	126	72	Channel.	Bronze.	8,800	36x6	36x4
MANHATTAN.	5500	50	16-Pass.	4	4	4	Centrif.	Storage.	Forcefeed.	Mul. Disc.	Sliding.	3 Chains.	126	72	Channel.	Bronze.	8,800	36x6	36x4
MANHATTAN.	6000	50	5-Ton Dump.	4	4	4	Centrif.	Storage.	Forcefeed.	Mul. Disc.	Sliding.	3 Chains.	126	72	Channel.	Bronze.	10,000	36x6	36x4
MANHATTAN.	6500	50	22-Pass. Bus.	4	4	4	Centrif.	Storage.	Forcefeed.	Mul. Disc.	Sliding.	3 Chains.	126	72	Channel.	Bronze.	8,500	36x6	36x4

COMMERCIAL CARS—Continued. CARS COSTING OVER \$5,000

MAKE AND MODEL	BODY			MOTOR		COOLING		IGNITION		Lubrication	Clutch	TRANSMISSION			CONTROL		WHEEL		Frame	BEARINGS		Weight	TIRES	
	Price	H. P.	Type	Seats	Cylinders	Stroke	Radiator	Pump	Magneto			Battery	Drive	Brakes	Steering	Base	Track	Motor		Transmis- sion	Axle		Front	Rear
COMMERCIAL CARS—Continued. CARS COSTING OVER \$5,000																								
RAPID	24-30	1-Ton.	Tubular.	Storage.	Forcedfeed.	Mul. Disc.	Planetary.	Chains.	2	Gear & Sector.	90	Pressed Steel.	Timken..	3	36x4 D1									
RAPID	24-30	1-1 1/2-Ton.	Tubular.	Storage.	Forcedfeed.	Mul. Disc.	Planetary.	Chains.	2	Gear & Sector.	110	Pressed Steel.	Timken..	3	36x4 D1									
RAPID	24-30	1-1 1/2-Ton.	Tubular.	Storage.	Forcedfeed.	Mul. Disc.	Planetary.	Chains.	2	Gear & Sector.	100	Pressed Steel.	Timken..	3	36x4 D1									
RAPID	24-30	12-20 Pass.	Tubular.	Storage.	Forcedfeed.	Mul. Disc.	Planetary.	Chains.	2	Gear & Sector.	111	Pressed Steel.	Timken..	3	36x4 D1									
RAPID	24-30	Fire or Pile	Tubular.	Storage.	Forcedfeed.	Mul. Disc.	Planetary.	Chains.	2	Gear & Sector.	111	Pressed Steel.	Timken..	3	36x4 D1									
RAPID	24-30	Ambulance.	Tubular.	Storage.	Forcedfeed.	Mul. Disc.	Planetary.	Chains.	2	Gear & Sector.	100	Pressed Steel.	Timken..	3	36x4 D1									
RAPID	60	5-Ton.	Centrifl.	Magneto.	Forcedfeed.	Mul. Disc.	Selective.	Chains.	4	Worm & Sector.	160	Pressed Steel.	Timken..	7,000	36x4 D1									
PITTSBURG (Elec.)	1000 Express.	1-Motor	D. Red n.	Chains.	4	Lever.	Sing. Red n.	Chains.	75	Wood.	Plain..	Plain..	32x2 1/2	32x2 1/2	32x4									
PITTSBURG (Elec.)	1-Ton Express.	2-Motors	D. Red n.	Chains.	108	Wheel.	D. Red n.	Chains.	64	Wood.	Plain..	Plain..	32x2 1/2	32x2 1/2	32x4									
PITTSBURG (Elec.)	2-Ton Express.	4-Motors	H. T. Mag.	Splash.	Mul. Disc.	Shaft.	Worm & Sector	2,600	Plain..	Plain..	32x4	32x4												
CLEVELAND AUTO C.B.	Taxicab.	4	H comb.	Centrifl.	H. T. Mag.	Splash.	Mul. Disc.	Shaft.	4	Worm & Sector	2,600	Plain..	Plain..	32x4	32x4									

FOREIGN CARS

RENAULT	8-10 Chassis	2	3	4	Tubular	Thermo.	Bosch.	Pump.	Cone.	Progres' ve.	3 Shaft.	4 Worm Gear.	50 Pressed Steel.	1,100 700x85	700x85
RENAULT	10-14 Chassis	2	3	4	Tubular	Thermo.	Bosch.	Pump.	Cone.	Progres' ve.	3 Shaft.	4 Worm Gear.	52 Pressed Steel.	1,350 810x90	810x90
RENAULT	10-14 Chassis	2	3	4	Tubular	Thermo.	Bosch.	Pump.	Cone.	Progres' ve.	3 Shaft.	4 Worm Gear.	54 Pressed Steel.	1,500 810x90	810x90
RENAULT	12-16 Chassis	4	3	4	Tubular	Thermo.	Bosch.	Pump.	Cone.	Progres' ve.	3 Shaft.	4 Worm Gear.	55 Pressed Steel.	1,600 810x90	810x90
RENAULT	14-20 Chassis	4	3	4	Tubular	Thermo.	Bosch.	Pump.	Cone.	Progres' ve.	3 Shaft.	4 Worm Gear.	55 Pressed Steel.	1,900 875x105	875x105
RENAULT	20-30 Chassis	4	4	5	Tubular	Thermo.	Bosch.	Pump.	Cone.	Progres' ve.	3 Shaft.	4 Worm Gear.	120 Pressed Steel.	2,500 915x120	915x120
RENAULT	35-45 Chassis	4	5	6	Tubular	Thermo.	Bosch.	Pump.	Cone.	Progres' ve.	3 Shaft.	4 Worm Gear.	132 Pressed Steel.	2,800 915x120	915x120
RENAULT	50-60 Chassis	6	4	5	Tubular	Thermo.	Bosch.	Pump.	Cone.	Progres' ve.	3 Shaft.	4 Worm Gear.	138 Pressed Steel.	3,200 935x135	935x135
LANCIA	8300 12-18 Chassis	4	3	5	H' comb.	Centrifl.	Bosch.	Forcedfeed.	Mul. Disc.	Selective.	4 Shaft.	3 Worm & Sector.	110 Pressed Steel.	1,700 810x90	810x120
LANCIA	3500 12-18 Chassis	4	3	5	H' comb.	Centrifl.	Bosch.	Forcedfeed.	Mul. Disc.	Selective.	4 Shaft.	3 Worm & Sector.	105 Pressed Steel.	1,000 810x90	810x120
LANCIA	3500 12-18 Chassis	4	3	5	H' comb.	Centrifl.	Bosch.	Forcedfeed.	Mul. Disc.	Selective.	4 Shaft.	3 Worm & Sector.	120 Pressed Steel.	1,000 810x90	810x120
LANCIA	4000 12-18 Town Car.	6	3	5	H' comb.	Centrifl.	Bosch.	Forcedfeed.	Mul. Disc.	Selective.	4 Shaft.	3 Worm & Sector.	110 Pressed Steel.	1,000 810x90	810x120
ISOTTA	4250 14-20 Chassis	4	3	5	4.72 Tubular	Gear	Magneto.	Pres.	Mul. Disc.	Selective.	4 Shaft.	3 Worm & Sector.	118 Pressed Steel.	1,880 875x105	875x105
ISOTTA	4500 18-24	4	4	5	4.72 Tubular	Gear	Magneto.	Pres.	Mul. Disc.	Selective.	4 Shaft.	3 Worm & Sector.	118 Pressed Steel.	2,320 870x90	880x120
ISOTTA	4600 18-24	4	4	5	4.72 Tubular	Gear	Magneto.	Pres.	Mul. Disc.	Selective.	4 Shaft.	3 Worm & Sector.	124 Pressed Steel.	2,420 870x90	880x120
ISOTTA	5250 15-35	6	3	5	4.72 Tubular	Gear	Magneto.	Pres.	Mul. Disc.	Selective.	4 Shaft.	3 Worm & Sector.	124 Pressed Steel.	1,980 875x105	875x105
ISOTTA	5600 40-55	4	5	6	5.91 Tubular	Gear	Magneto.	Pres.	Mul. Disc.	Selective.	4 Shaft.	3 Worm & Sector.	124 Pressed Steel.	2,640 910x90	920x120
ISOTTA	8500 50-55	4	5	6	5.91 Tubular	Gear	Magneto.	Pres.	Mul. Disc.	Selective.	4 Shaft.	3 Worm & Sector.	128 Pressed Steel.	2,760 875x105	935x135
ISOTTA	8500 50	4	5	6	5.91 Tubular	Gear	Magneto.	Pres.	Mul. Disc.	Selective.	4 Shaft.	3 Worm & Sector.	118 Pressed Steel.	2,600 870x90	880x120
C. G. V.	2500 40 Land' ulet.	6	3	2	4.8 Tubular	Thermo.	Bosch.	Pump.	Cone.	Progres' ve.	3 Shaft.	3 Worm.	54 Steel.	1,250 810x90	32x31
C. G. V.	3000 12-15 Rural Bout.	4	3	2	4.8 Tubular	Thermo.	Bosch.	Pump.	Cone.	Progres' ve.	3 Shaft.	3 Worm.	54 Steel.	1,250 810x90	32x31
C. G. V.	3250 15-30 Chassis	4	3	2	4.8 Tubular	Thermo.	Bosch.	Pump.	Cone.	Progres' ve.	3 Shaft.	3 Worm.	54 Steel.	1,250 810x90	32x31
C. G. V.	3300 12-15 Chassis	6	4	4	4.8 Tubular	Thermo.	Bosch.	Pump.	Cone.	Progres' ve.	3 Shaft.	3 Worm.	54 Steel.	1,250 810x90	32x31
C. G. V.	4500 20-30 Chassis	4	4	2	4.8 Tubular	Thermo.	Bosch.	Pump.	Cone.	Progres' ve.	3 Shaft.	3 Worm.	54 Steel.	1,750 920x120	36x44
C. G. V.	5000 30-40 Chassis	4	5	8	5.2 Tubular	Thermo.	Bosch.	Pump.	Cone.	Progres' ve.	3 Shaft.	3 Worm.	54 Steel.	1,850 920x120	36x44
C. G. V.	6000 50-60 Chassis	4	6	6	6.4 Tubular	Thermo.	Bosch.	Pump.	Cone.	Progres' ve.	3 Shaft.	3 Worm.	54 Steel.	2,100 920x120	36x44
C. G. V.	7500 75-90 Chassis	4	3	4	6.4 Tubular	Thermo.	Bosch.	Pump.	Cone.	Progres' ve.	3 Shaft.	3 Worm.	54 Steel.	2,300 920x120	36x44
C. G. V.	10000 90-120 Chassis	4	7	6	6.4 Tubular	Thermo.	Bosch.	Pump.	Cone.	Progres' ve.	3 Shaft.	3 Worm.	54 Steel.	1,950 920x120	36x44
DeDIETRICH - VPH.	14 Chassis														
DeDIETRICH - Cvd.	20 Chassis	4	3	4	7	H. T. Mag.		Pres.	Disc.	Selective.	4 Shaft.	4 Worm & Sct.	118 Pressed Steel.	875x105	875x105
DeDIETRICH - Cvd.	20 Chassis	4	3	4	7	L. T. Mag.		Pres.	Disc.	Selective.	4 Shaft.	4 Worm & Sct.	120 Pressed Steel.	920x120	920x120
DeDIETRICH - Cvd.	18 Chassis	4	3	4	7	L. T. Mag.		Pres.	Disc.	Selective.	4 Shaft.	4 Worm & Sct.	120 Pressed Steel.	870x90	920x120
DeDIETRICH - Cvd.	18 Chassis	4	3	4	7	L. T. Mag.		Pres.	Disc.	Selective.	4 Shaft.	4 Worm & Sct.	129 Pressed Steel.	875x105	935x135
DeDIETRICH - Cvd.	28 Chassis	4	4	7	5.5	L. T. Mag.		Pres.	Disc.	Selective.	4 Shaft.	4 Worm & Sct.	120 Pressed Steel.	870x90	920x120
DeDIETRICH - Cvd.	28 Chassis	4	4	7	5.5	L. T. Mag.		Pres.	Disc.	Selective.	4 Shaft.	4 Worm & Sct.	130 Pressed Steel.	875x105	935x135
DeDIETRICH - Cvd.	40 Chassis	4	4	5	5.9	L. T. Mag.		Pres.	Disc.	Selective.	4 Shaft.	4 Worm & Sct.	123 Pressed Steel.	875x105	935x135
DeDIETRICH - Cvd.	40 Chassis	4	4	5	5.9	L. T. Mag.		Pres.	Disc.	Selective.	4 Shaft.	4 Worm & Sct.	133 Pressed Steel.	875x105	935x135
DeDIETRICH - FER.	60 Chassis	4	4	5	6	L. T. Mag.		Pres.	Disc.	Selective.	4 Shaft.	4 Worm & Sct.	128 Pressed Steel.	875x105	935x135
DeDIETRICH - Cvd.	75 Chassis	6	5	1	5.9	L. T. Mag.		Pres.	Disc.	Selective.	4 Shaft.	4 Worm & Sct.	138 Pressed Steel.	875x105	935x135
DeDIETRICH - Cvd.	75 Chassis	6	5	1	5.9	L. T. Mag.		Pres.	Disc.	Selective.	4 Shaft.	4 Worm & Sct.	147 Pressed Steel.	875x105	935x135
FIAT	2750 12 Chassis	4	3	5	9H' comb.	Centrifl.	Bosch.	Forcedfeed.	Mul. Disc.	Selective.	3 Shaft.	3 Worm & Sector.	54 Steel.	1,550 810x90	810x90
FIAT	3500 15 Chassis	4	3	5	12H' comb.	Centrifl.	Bosch.	Forcedfeed.	Mul. Disc.	Selective.	3 Shaft.	3 Worm & Sector.	56 Steel.	1,900 810x90	810x120
FIAT	4500 20 Chassis	4	4	5	12H' comb.	Centrifl.	Bosch.	Forcedfeed.	Mul. Disc.	Selective.	3 Shaft.	3 Worm & Sector.	56 Steel.	2,350 910x90	920x120
FIAT	5000 40 Chassis	4	4	5	9H' comb.	Centrifl.	Bosch.	Forcedfeed.	Mul. Disc.	Selective.	4 Shaft.	4 Worm & Sector.	56 Steel.	2,500 910x90	920x120
FIAT	5250 45 Chassis	4	4	5	12H' comb.	Centrifl.	Bosch.	Forcedfeed.	Mul. Disc.	Selective.	4 Shaft.	4 Worm & Sector.	56 Steel.	2,500 910x90	920x120
FIAT	6000 45 Chassis	6	4	5	12H' comb.	Centrifl.	Bosch.	Forcedfeed.	Mul. Disc.	Selective.	4 Shaft.	4 Worm & Sector.	56 Steel.	2,650 920x120	920x120
FIAT	7250 60 Chassis	4	5	5	15H' comb.	Centrifl.	Bosch.	Forcedfeed.	Mul. Disc.	Selective.	4 Shaft.	4 Worm & Sector.	56 Steel.	2,424 875x105	880x120
PANHARD	1850 8-11 Optional.	2	3	3	4.72 Coil.	Centrifl.	H. T. Mag.	Forcedfeed.	Mul. Disc.	Progres' ve.	3 Shaft.	2 Worm & Sector.	56 Pressed Steel.	1,700 875x105	875x105
PANHARD	3000 10-15 Optional.	4	3	5	4.72 Coil.	Centrifl.	H. T. Mag.	Forcedfeed.	Mul. Disc.	Progres' ve.	3 Shaft.	2 Worm & Sector.	56 Pressed Steel.	2,100 875x105	875x105
PANHARD	3500 15-20 Optional.	4	3	5	4.72 Coil.	Centrifl.	H. T. Mag.	Forcedfeed.	Mul. Disc.	Progres' ve.	3 Shaft.	2 Worm & Sector.	56 Pressed Steel.	2,200 875x105	875x105
PANHARD	400 18-25 Optional.	4	3	5	4.72 Coil.	Centrifl.	H. T. Mag.	Forcedfeed.	Mul. Disc.	Progres' ve.	3 Shaft.	2 Worm & Sector.	56 Pressed Steel.	2,200 875x105	875x105
PANHARD	400 18-25 Optional.	4	3	5	5.1 Coil.	Centrifl.	H. T. Mag.	Forcedfeed.	Mul. Disc.	Progres' ve.	3 Shaft.	2 Worm & Sector.	56 Arm'd Wood.	2,500 920x120	920x120

FOREIGN CARS—Continued

MAKE AND MODEL	BODY		MOTOR		COOLING		IGNITION		Lubrication		CLUTCH		TRANSMISSION			CONTROL		WHEEL		FRAME	BEARINGS		Axle	Weight	TIRES	
	Price	H.P.	Type	Seats	Cylinders	Bore	Stroke	Radiator	Pump	Magneto	Battery	Type	Speeds	Drive	Brakes	Steering	Base	Track	Motor		Transmis- ion					
PANHARD.....	\$5000	30-40	Optional.....	9	3.54	4.72	Coil.....	Centrif'l.	H. T. Mag.	Forcedfeed.	Mul. Disc.	Selective.....	4	Chains.	3	Worm & Sector.	118	56	Pressed Steel.	Plain.	Ball.	2,250	920x120	920x120		
PANHARD.....	5400	35-45	Optional.....	9	4.92	5.91	H'comb.	Centrif'l.	H. T. Mag.	Forcedfeed.	Mul. Disc.	Progr.ve.	4	Chains.	3	Worm & Sector.	125	56	Arm'd Wood.	Plain.	Ball.	2,600	920x120	920x120		
PANHARD.....	7500	50-60	Optional.....	4	5.71	6.50	H'comb.	Centrif'l.	H. T. Mag.	Forcedfeed.	Mul. Disc.	Progr.ve.	4	Chains.	3	Worm & Sector.	127	56	Arm'd Wood.	Plain.	Ball.	2,700	920x120	920x120		
PANHARD.....	8700	65-80	Optional.....	6	5.32	5.51	H'comb.	Centrif'l.	H. T. Mag.	Forcedfeed.	Mul. Disc.	Selective.....	4	Chains.	3	Worm & Sector.	126	56	Pressed Steel.	Plain.	Ball.	2,600	920x120	920x120		
HOTCHKISS.....	3500	16-20	Chassis.....	4	3.74	4.33	H'comb.	Centrif'l.	Eisemann.	Pressure.	Cone.	Selective.....	4	Shaft.	3	Worm & Sector.	114 1/2	53	Pressed Steel.	Plain.	Ball.	1,600	875x105	875x105		
HOTCHKISS.....	4250	20-30	Chassis.....	4	3.75	4.25	H'comb.	Centrif'l.	Eisemann.	Pressure.	Cone.	Selective.....	4	Shaft.	3	Worm & Sector.	119	56	Pressed Steel.	Plain.	Ball.	2,000	920x120	920x120		
HOTCHKISS.....	4750	30-40	Chassis.....	4	4.72	5.51	H'comb.	Centrif'l.	Eisemann.	Pressure.	Cone.	Selective.....	4	Shaft.	3	Worm & Sector.	119 1/2	56	Pressed Steel.	Plain.	Ball.	2,200	920x120	920x120		
HOTCHKISS.....	6250	65	Chassis.....	6	4.72	5.51	H'comb.	Centrif'l.	Eisemann.	Pressure.	Cone.	Selective.....	4	Shaft.	3	Worm & Sector.	132	56	Pressed Steel.	Plain.	Ball.	2,900	920x120	920x120		
DELAUNAY-BELVLE.....	2800	10-15	Optional.....	4	3.44	4.44	H'comb.	Centrif'l.	Bosch.	Pump.....	Cone.	Sliding.....	3	Shaft.	3		118		Pressed Steel.	Plain.	Ball.	810x90	810x90	810x90		
DELAUNAY-BELVLE.....	3500	15-22	Optional.....	4	3.44	4.44	H'comb.	Centrif'l.	Bosch.	Pump.....	Cone.	Sliding.....	4	Shaft.	3		123		Pressed Steel.	Plain.	Ball.	880x120	880x120	880x120		
DELAUNAY-BELVLE.....	4000	15-25	Optional.....	6	3.44	4.44	H'comb.	Centrif'l.	Bosch.	Pump.....	Cone.	Sliding.....	4	Shaft.	3		125		Pressed Steel.	Plain.	Ball.	880x120	880x120	880x120		
DELAUNAY-BELVLE.....	4400	20-30	Optional.....	6	3.44	4.44	H'comb.	Centrif'l.	Bosch.	Pump.....	Cone.	Sliding.....	4	Shaft.	3		126		Pressed Steel.	Plain.	Ball.	880x120	880x120	880x120		
DELAUNAY-BELVLE.....	5000	28-35	Optional.....	4	3.44	4.44	H'comb.	Centrif'l.	Bosch.	Pump.....	Cone.	Sliding.....	4	Shaft.	3		128		Pressed Steel.	Plain.	Ball.	880x120	880x120	880x120		
DELAUNAY-BELVLE.....	5600	35-45	Optional.....	6	3.44	4.44	H'comb.	Centrif'l.	Bosch.	Pump.....	Cone.	Sliding.....	4	Shaft.	3		130		Pressed Steel.	Plain.	Ball.	880x120	880x120	880x120		
DELAUNAY-BELVLE.....	6100	40-50	Optional.....	6	3.44	4.44	H'comb.	Centrif'l.	Bosch.	Pump.....	Cone.	Sliding.....	4	Shaft.	3		144		Pressed Steel.	Plain.	Ball.	935x135	935x135	935x135		
DELAUNAY-BELVLE.....	7000	40-55	Optional.....	6	3.44	4.44	H'comb.	Centrif'l.	Bosch.	Pump.....	Cone.	Sliding.....	4	Shaft.	3		144		Pressed Steel.	Plain.	Ball.	935x135	935x135	935x135		
DELAUNAY-BELVLE.....	10000	60-75	Optional.....	6	3.44	4.44	H'comb.	Centrif'l.	Bosch.	Pump.....	Cone.	Sliding.....	4	Shaft.	3		147		Pressed Steel.	Plain.	Ball.	990x135	990x135	990x135		

T. B. JEFFERY EXHIBIT AT THE NEW YORK SALESDROOMS, 38 WEST 62d STREET

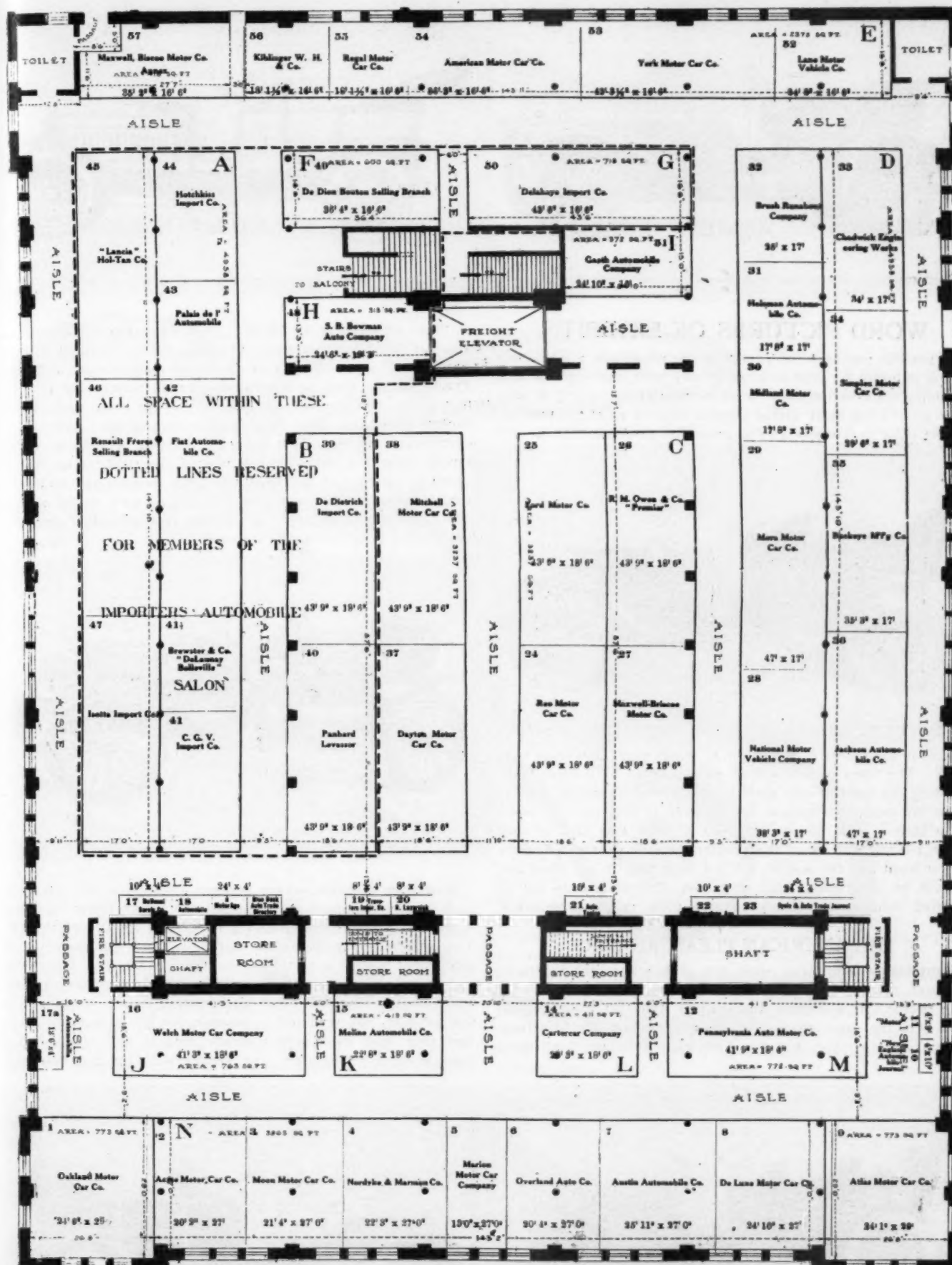
MAKE AND MODEL	H.P.	Type	Cylinders	Bore	Stroke	Radiator	Pump	Magneto	Battery	Lubrication	Clutch	TRANSMISSION	CONTROL	WHEEL	Brakes	Steering	Frame	BEARINGS	Weight	TIRES
RAMBLER-47.....	\$1150	22 Optional.	2	5	6	Tubular.	Gear.	Extra.	Storage.	Forced.	Disc.	Planetary.	4 Nut & Screw.	102	56	Pressed Steel.	Wh. Metal.	Roller.	34x4	34x4
RAMBLER-41.....	1350	22 Optional.	2	5	6	Tubular.	Gear.	Extra.	Storage.	Forced.	Disc.	Planetary.	4 Nut & Screw.	106	56	Pressed Steel.	Wh. Metal.	Roller.	34x4	34x4
RAMBLER-44.....	2250	34 Optional.	4	4	4	Tubular.	Gear.	Extra.	Storage.	Forced.	Disc.	Planetary.	4 Nut & Screw.	112	56	Pressed Steel.	Wh. Metal.	Roller.	34x4	34x4
RAMBLER-45.....	2500	45 Touring.	7	4	5	4	Tubular.	Gear.	Extra.	Forced.	Disc.	Planetary.	4 Nut & Screw.	123	56	Pressed Steel.	Wh. Metal.	Roller.	34x4	34x4

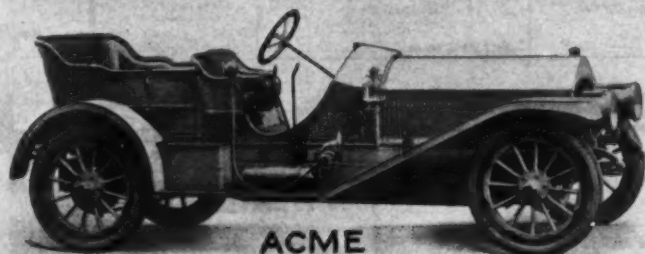
AMERICAN LOCOMOTIVE EXHIBIT AT WALDORF ASTORIA

LOCOMOTIVE (Alco).....	\$4000	22 Touring.....	6	3	94	4.75	H' comb.	L. T. Mag.</
------------------------	--------	-----------------	---	---	----	------	----------	-------	------------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	---------

MOTOR AND ACCESSORY MANUFACTURERS.
(First Gallery)

Ajax-Grieb Rubber Company.
American Ball Bearing Company.
American Electrical Novelty Manufacturing Co.
Atwater-Kent Manufacturing Works.
Atwood-Castle Company.
Autocoll Company.
Auto Improvement Company.
Badger Brass Manufacturing Company.
Baldwin Chain & Manufacturing Company.
S. F. Bowser & Company.
Briscoe Manufacturing Company.
Brown Lipe Gear Company.
Byrne, Kingston & Company.
Coes Wrench Company.
Columbia Nut & Bolt Company.
Connecticut Telephone & Electric Company.
Consolidated Rubber Tire Company.
Continental Caoutchouc Company.
C. Cowles & Company.
Wm. Cramp & Sons Ship & Engine Building Co.
Diamond Chain & Manufacturing Company.
Diamond Rubber Company.
Joseph Dixon Crucible Company.
Dow Tire Company.
Edmunds & Jones Manufacturing Company.
Electric Storage Battery Company.
Empire Automobile Tire Company.
Firestone Tire & Rubber Company.
Flisk Rubber Company.
G & J Tire Company.
Gabriel Horn Manufacturing Company.
Gilbert Manufacturing Company.
Gemmer Manufacturing Company.
B. F. Goodrich Company.
Goodyear Tire & Rubber Company.
Gray & Davis.
Gray-Hawley Manufacturing Company.
C. T. Ham Manufacturing Company.
A. W. Harris Oil Company.
Hartford Rubber Works Company.
Hartford Suspension Company.
Heinze Electric Company.
Herz & Company.
Hess-Bright Manufacturing Company.
The Hoffecker Company.
Hyatt Roller Bearing Company.
Kokomo Electric Company.
Leather Tire Goods Company.
Light Manufacturing and Foundry Company.
McCord Manufacturing Company.
C. A. Metzger.
Michelin Tire Company.
Miller, Charles E.
Morgan & Wright.
A. R. Mosler & Company.
Motsinger Device Manufacturing Company.
Motz Clincher Tire & Rubber Company.
National Battery Company.
National Carbon Company.
National Coil Company.
Never-Miss Spark Plug Company.
N. Y. & N. J. Lubricant Company.
Oliver Manufacturing Company.
Pantasote Company.
Pennsylvania Rubber Company.
Pittsfield Spark Coil Company.
Randall-Falchney Company.
Remy Electric Company.
Republic Rubber Company.
J. H. Sager Company.
C. A. Shaler Company.
Shelby Steel Tube Company.
A. O. Smith Company.
Jones Speedometer Company.
Spicer Universal Joint Manufacturing Company.
C. F. Splitdorf.
Sprague Umbrella Company.
Standard Roller Bearing Company.
Standard Welding Company.
Stewart & Clark Manufacturing Company.
Swinehart Clincher Tire & Rubber Company.
Timken Roller Bearing Axle Company.
Veeder Manufacturing Company.
Warner Gear Company.
Warner Instrument Company.
Weed Chain Tire Grip Company.
Westchester Appliance Company.
F. H. Wheeler.
Whitney Manufacturing Company.
Witherbee Igniter Company.





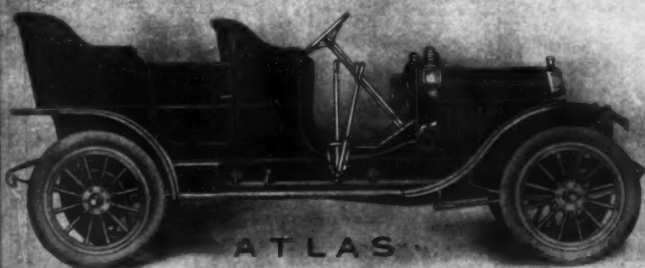
ACME



AUSTIN

WORD PICTURES OF EXHIBITS.

A possible purchaser of an automobile might lose a whole day trying to locate the kind of a car he may want, and with the idea of aiding the selection, short word pictures of the cars to be seen may serve a far more useful purpose than to extol the beauties of the show as a whole and to generalize in relation to the ad-



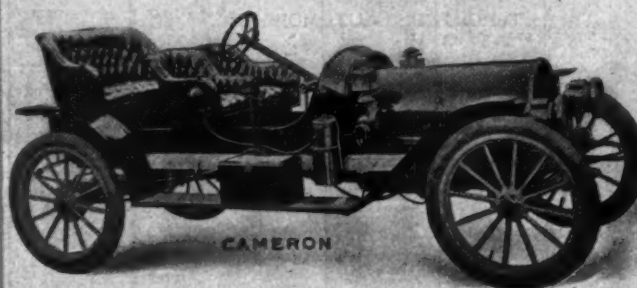
ATLAS

vances in the industry, in relation to which every autoist is fully alive. The word picture will be supplemented by a short table, showing the types of cars made by the several companies, and, in some instances, illustrations will be given to help out. It would have been a good idea to illustrate at least two cars of each make, but this was out of the question, because photographs were not at hand and the makers did not have time to get them out. It will be understood, then, that cars illustrated were not so selected through any desire to give them undue prominence.

THE AMERICAN PLEASURE CARS.

American.—Beginning with the 50-horsepower American roadster, there is an attractive line of cars listed by the American Motor Car Company, Indianapolis, Ind., for the 1909 season. On the same chassis as the roadster are the American "Toy Tonneau" type, and the American "Wayfarer," all three

of these cars listing at \$3,750. Then there are the American "Tourist" and the American "Traveler," both being priced at \$4,000, while above them is the limousine model listing at \$5,000. Practically the same 50-horsepower chassis forms the foundation in the case of each, the only differences being such as are necessary to adapt it to the particular type of body, one of the chief points of distinction being the varying wheelbase, which ranges from 110 inches in the case of the roadster up to 124 inches in the case of the "Wayfarer," toy tonneau and limousine models. The motor dimensions are 5 1-4 by 5 1-2 inches, a cone clutch, four speed and reverse selective type of sliding gear and shaft drive constituting the transmission.

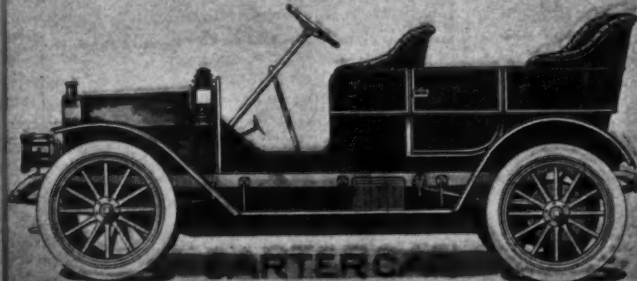


CAMERON

American Simplex.—This product comprises four models, each with a 50-horsepower motor of the four-cylinder type and transmission of the sliding gear genera, three speeds and reverse. The 50-horsepower motor is distinctive and the construction throughout is such as to attract the notice of buyers. The motor is two-cycle, for illustration, and the valveless condition, with water cooling and such other nice features as are recognized in this product, has rendered it possible for the makers to claim that they have made mile-a-minute records and established a reputation of a character that speaks well for the two-cycle



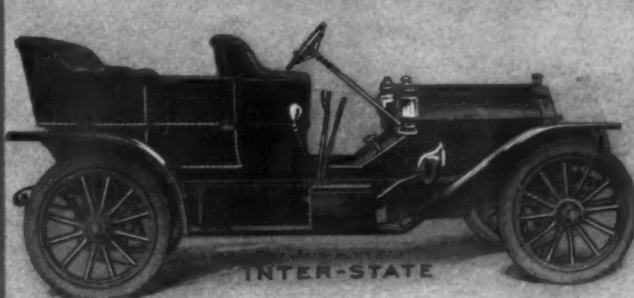
AMERICAN



CARTER



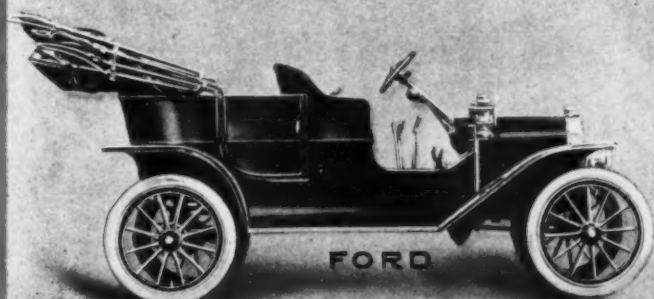
CHADWICK



INTER-STATE

motor. The American Simplex is made at the works of the Simplex Motor Car Company, Mishawaka, Ind.

Acme.—The line of the Acme Motor Car Company, Reading, Pa., comprises some eight models, ranging in price from \$2,500 to \$6,000, and with bodies seating from two to seven. Three of the models are fitted with transmissions of three-speed and reverse and the remaining models are of the four-speed type of transmission. In this line of cars customers can choose between the four and six-cylinder motors; the first is of 30 horsepower or less, and the second choice is 48 horsepower or above. Reference to the general table will give the data of the Acme line.



FORD

A-K.—The Allen-Kingston Motor Car Company, of New York City, offer to a discriminating public two models as follows: a 17-horsepower car with a four-cylinder motor for touring, and a 48-horsepower chassis with body work to suit. The 48-horsepower motor is with cylinders 3.12 by 6.18 inches, bore and stroke respectively. Attention is called to the use of the "New Departure" ball bearings in the cars almost to the entire exclusion of plain bearings. The 17-horsepower model is of the type involving "en bloc" cylinder castings and the "left-hand" steering is something to take notice of. This model is especially designed for maneuvering in congested streets and can

turn in an ordinary street. It is the desire of the company to call attention to the details of the line in point of finish, even down to hardening the nuts, which are finished in blue.

Atlas.—The Atlas Motor Car Company, Springfield, Mass., will be one of the very few concerns showing cars with two and three-cylinder motors, these, of course being of the two-cycle



JACKSON

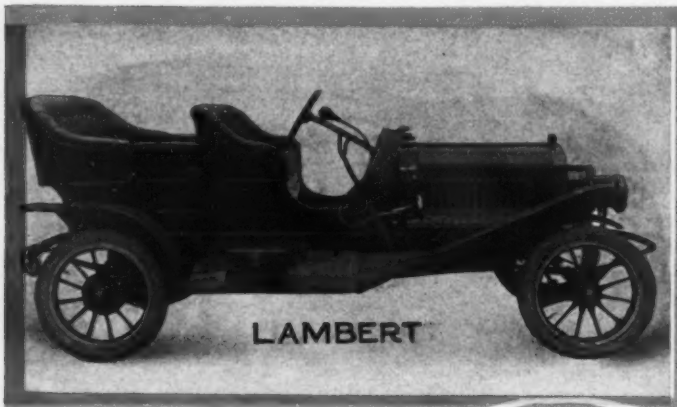
type. Two chassis are shown in five different models. These are the 20-horsepower two-cylinder Atlas, which is listed as a runabout with rumble seat at \$1,450, as a taxicab at \$2,350, and as a town car at \$2,500. Then there is the three-cylinder 30-horsepower Atlas, which is shown either as a runabout or as a touring type at \$1,900 and \$2,000 respectively. The cylinder dimensions in the case of each of these chassis are the same, namely 4 1-2 by 4 1-2 inches, the Atwater Kent spark generator being fitted for ignition, this apparatus having proved itself particularly well adapted to the two-cycle motor. The clutch is a contracting band type, while the small chassis is fitted with a two-speed sliding gear, and the 30-horsepower chassis with a three-speed selective type. The tire equipment of the 20-horsepower Atlas runabout is 32 by 3 1-2 inches, while with a closed body 30 by 4-inch tires are used, the equipment of the larger cars being 34 by 4-inch all round, quick detachable rims being fitted in every case.



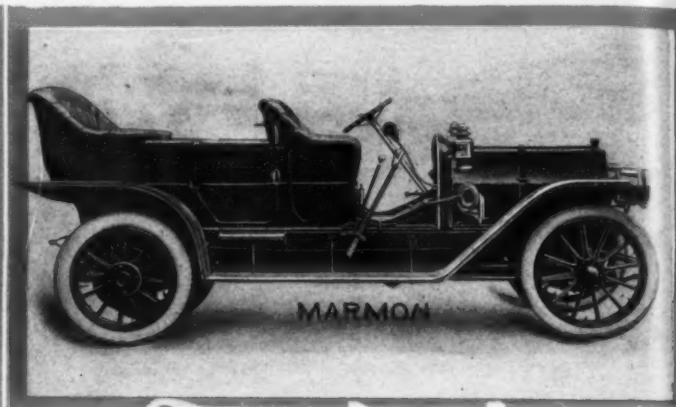
GAETH



KISSELKAR



LAMBERT



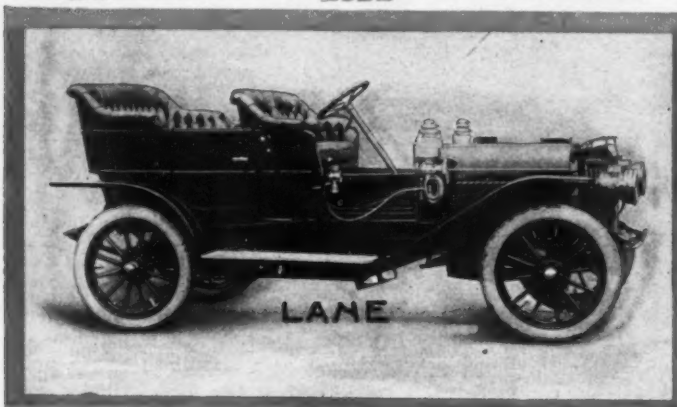
MARMON

Austin.—This line comprises some nine models, ranging in price from \$2,850 to \$6,000, and the motors range in power from 45 to 90 horsepower, some of which are four-cylinders while the remainder of them are six-cylinders. The body work is of a high order and seats are from three, in the R-45 roadster, to seven in the L-60. The transmissions are with three and four speeds, depending upon the model, and a wide range of choices is afforded the company's patrons. The general table offered will give detailed data of the models in the Austin line, the product of the Austin Automobile Company, Grand Rapids, Mich.

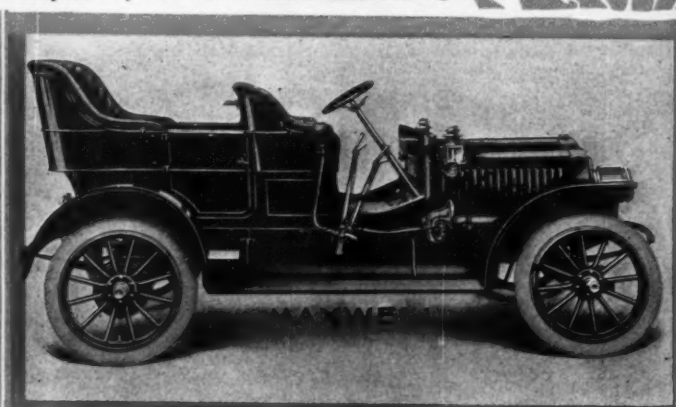
Alco.—Formerly the "Berliet" as made by the American

at the Waldorf-Astoria from January 2 to 23, where the cars can be seen.

Brush.—Apart from a slight detail here and there, practically no changes have been made in the Brush runabout for 1909 as compared with its predecessor, and the latter proved so successful that the builders, the Brush Runabout Company, Detroit, Mich., are planning to turn out no less than 3,000 of these little \$550 cars, besides 1,000 of the Brush delivery wagons mounted on the same chassis. The records established by the Brush runabout during the past year by demonstrating its ability to travel all over the country on a fast schedule and its adoption by the Government in Washington for mail delivery



LANE

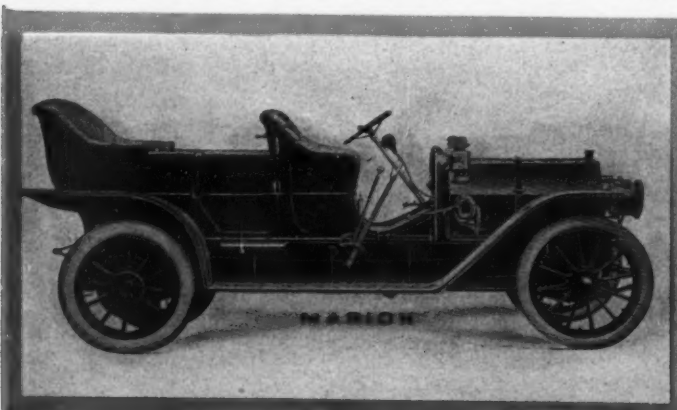


MAYWE

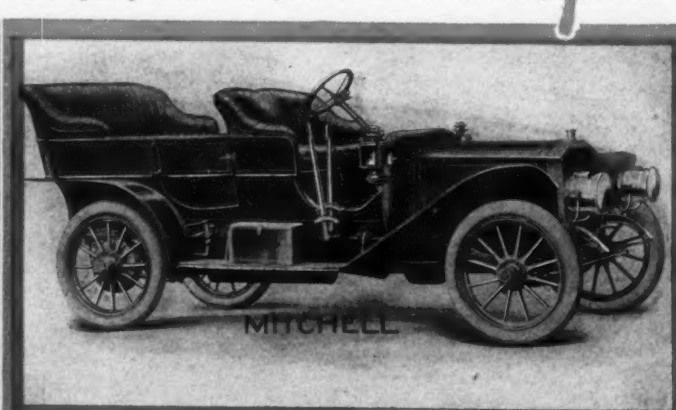
Locomotive Company, Providence, R. I., would scarcely require any introduction at all were it not for a desire to remind the patrons of the company of the fact that in addition to the "four" a "six" is of the line, and a "taxicab" also numbers among the good. The "six" rated at 60 horsepower and the cylinder dimensions are 4 3/4 x 5 1/2 inches bore and stroke respectively. As respects the "four" it is to say, the cylinder dimensions are 4 3/4 by 5 1/2 inches bore and stroke respectively for the 40-horsepower model, while the taxicab demands the cylinder dimensions on a basis of 3 15/16 by 4 3/4 inches bore and stroke respectively. This company is holding to its usual policy of maintaining a separate exhibition, and they will entertain friends

purposes give some idea of what the little car is capable of.

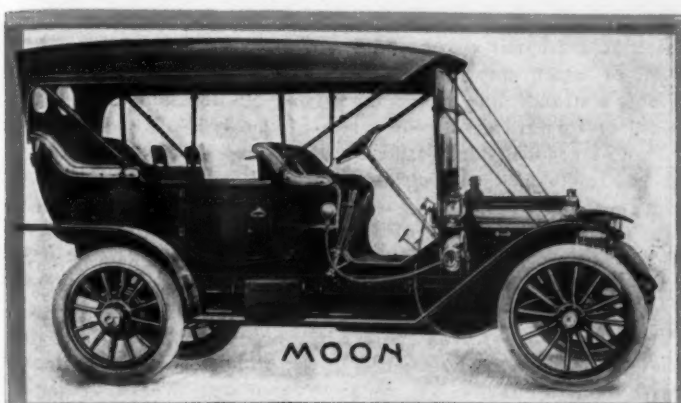
Cameron.—In these days when water-cooling is supreme and arrogant in its supremacy, it really is refreshing to come across an air-cooled motor now and then, particularly if this be a low-priced car of marked simplicity intended for the man of moderate means and equally moderate mechanical ability. To such people the car made by the Cameron Motor Car Company, of Beverly, Mass., will appeal with a peculiar force. This little machine is now built in both four and six-cylinders, with runabout, roadster and touring car bodies. The transmission, although affording direct drive on all three forward speeds, is simplicity itself. This, located on the rear axle, is an exclu-



MARION



MITCHELL



MOON

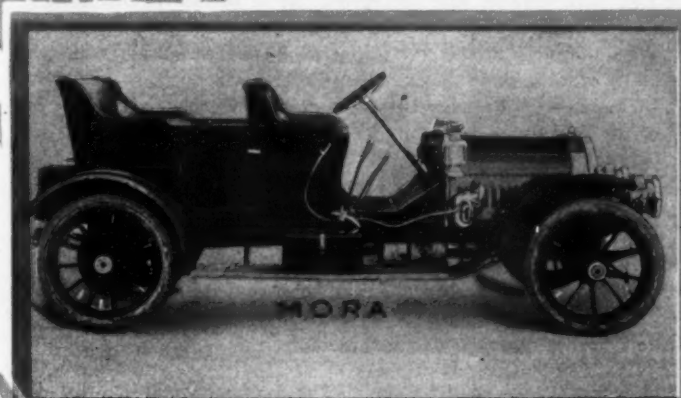


NATIONAL

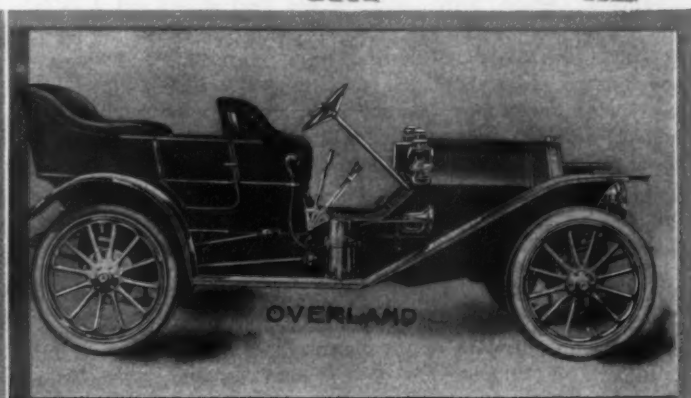
sive Cameron feature, this company holding patents which cover it thoroughly. These cars, owing to their extreme simplicity, are very light in weight, varying from 1,100 pounds in the four-cylinder runabout to 1,650 in the six-cylinder touring car. The prices of this product are within the reach of the masses, varying from \$900 up to \$1,500, the latter figure being asked for the six-cylinder models regardless of type of body.

Cartercar.—During the time that the Cartercar has been on the market it has served to show in an unmistakable manner the capacity of the friction type of transmission for driving a car under the most severe conditions to be met with in automobiling, and doubtless the greater part of its success has been

Chadwick.—The builders of the Chadwick cars have always been consistent advocates of the high-powered machine, and its line for the coming season shows nothing smaller than the 60-horsepower six-cylinder chassis, which made such an excellent showing in the leading contests of the year, while it carried off top-line honors at practically every hill-climb of importance in which it was entered. The efforts of both the designer and factory have always been concentrated on the production of a single type of chassis, which has accordingly been brought to a high state of perfection. The Chadwick is probably the only car ever built that has the distinction of being regularly fitted with two high-tension magnetos as a standard part of its equipment.



MORA

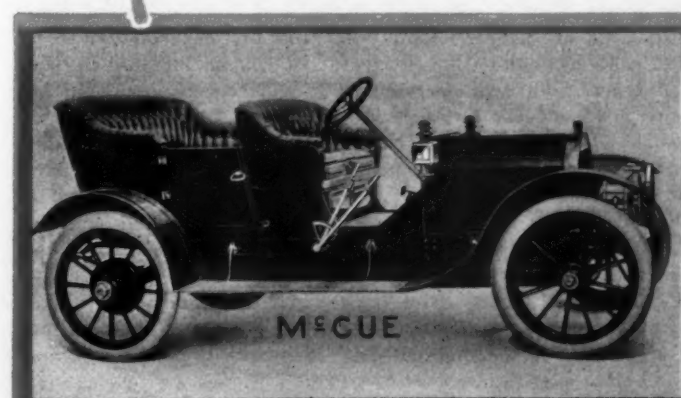


OVERLAND

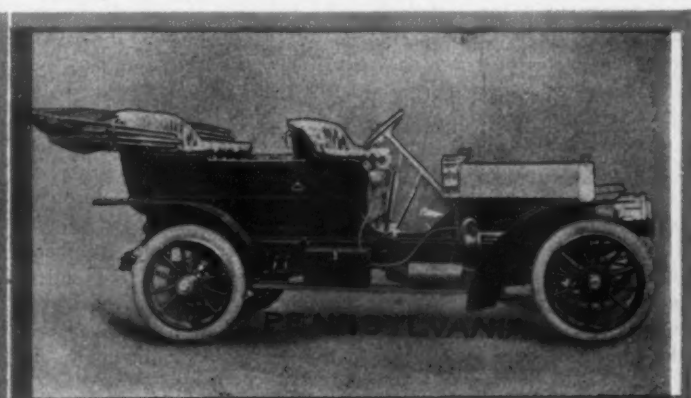
based upon its performances under adverse circumstances. For the coming season its builders, the Motorcar Company, Detroit, Mich., will exhibit an 18-20-horsepower chassis and a 22-24-horsepower chassis, both being equipped with the horizontal opposed type of two-cylinder water-cooled motor. So far as models are concerned, three will be listed, starting with model H runabout, listing at \$1,000, this car having the smaller motor; then there will be a racy type Cartercar, with the 24-horsepower motor, listing at \$1,350, while model K touring car, seating five passengers, will also list at the same price. With the exception of minor improvements here and there, the chassis design is substantially the same as last year.

It embodies numerous other distinctive features such as the cop-water jacket encircling each one of the twin-cylinder castings, thus making the cooling of each pair of cylinders very uniform and at the same time independent of the others. Three types of bodies are listed, seating two, five and seven passengers. The Chadwick Engineering Company, Pottstown, Pa., are the builders.

Coates-Goshen.—With two chassis and four models, the Coates-Goshen Automobile Company, Goshen, N. Y., has entered the show prepared to hold its own in view of the modern work put upon the cars this company has to offer to its patrons. The model "25" has a four-cylinder motor, 4 by 4 inches bore and stroke respectively. It is water-cooled, has a cellular radiator,



M'GUE





and the ignition includes a "Bosch" magneto. The selective transmission has three speeds forward and reverse, and the wheelbase is 112 inches, with a 56 1-2-inch tread. Referring to model "32," it is noted that the bore and stroke respectively of the motor are 4 1-2 by 5 inches, and in general all the good features to be found on the model "25" are included. The transmission is with three speeds, as well as reverse, with a wheelbase of 116 inches and 56 1-2-inch tread. For more complete data of the cars, look for same in the general table of the cars.

De Luxe.—The De Luxe Motor Car Company, Detroit, Mich., will make but one chassis for the 1909 season and will list this in three models, namely, the model C touring car, model D tourabout and model C limousine, the first two listing at \$5,000 while the last named is \$6,250. The motor dimensions are 5-inch bore by 5 1-4-inch stroke and it is rated at 50-60-horsepower, its chief distinguishing feature being the use of oppositely disposed valves placed in the cylinder heads at an angle and operated by a single rocker arm from the same camshaft. High tension ignition is used, a magneto and storage battery being supplied as sources of current for the dual ignition system. The gear set is a selective type, giving four speeds forward, final drive being by shaft. Two sets of brakes are fitted on the driving wheels. The wheelbase is 121 inches in the case of all three models and the tire equipment is 36 by 5 inches all round. Both the touring model and the limousine have a capacity for seven passengers, while the tourabout seats five.

Ford.—Quite in contrast with its concentration of effort on a single type last year, the Ford runabout, the Ford Motor Company, Detroit, Mich., will for the 1909 season list a larger line of models than it has ever built before. There will be no less than seven types of Fords to choose from, beginning with the touring car at \$850, of which doubtless a very large proportion of the proposed output of 25,000 cars will consist, and ending with the four-passenger tourabout at \$1,000. Between these there is a three-passenger inside-driven coupé, listing at \$950, the Ford taxicab at the same price, a two-passenger runabout, three-passenger roadster, and a five-passenger town car, all of which, like the tourabout, are listed at \$1,000. Naturally, all of these models will have as their foundation the 20-horsepower four-cylinder chassis, the chief feature of novelty of which is the new ignition system, consisting of an inductor type of magneto embodied in the flywheel, thus making it an integral part of the motor, so that it goes without saying that a magneto will form part of the standard 1909 equipment.

Gaeth.—The Gaeth car for 1908 was the outcome of a policy of consistent adherence to certain lines of design, along which Paul Gaeth has been building cars on a small scale for several years, so that it was to be expected that the Gaeth Automobile Company, Cleveland, O., would show a machine reflecting the same tendencies for the 1909 season. Attention will be confined to a single type of chassis for pleasure car use, while the same is true of the commercial end, the Gaeth delivery wagon being continued in substantially the same form. The pleasure car is known as Model XX and is rated at 38-horsepower, being equipped with a four-cylinder vertical motor of special design that has been developed by Mr. Gaeth, this referring particularly to the low-tension ignition system and the means provided for retarding and advancing the spark timing. A band clutch, three speed selective sliding gear and shaft drive complete the transmission. Four-seated roaster, and five and seven-passenger touring models are listed at \$3,500, while the Gaeth limousine is priced at \$4,500.

Gyroscope.—This is the product of the Blomstrom Manufacturing Company, Detroit, Mich., and as its name indicates it is entirely in a class by itself. The two-cylinder, horizontal opposed motor is placed parallel with the side members of the frame, being supported on two special transverse members located under the bonnet. By removing two bolts, the entire power-plant can be taken out complete. The flywheel is of unusually large diameter and runs in a horizontal plane beneath the cylinders, thus giving rise to the name. At right angles to

the flywheel and so arranged as to contact with the under face of it is a friction wheel, sliding on a squared shaft, an extension of which constitutes the propeller shaft of the car, thus giving a straight line drive. By moving this friction wheel backward or forward across the center of the flywheel, an extensive range of gradually increasing or decreasing forward or reverse speeds is obtained. By means of a small friction clamp on the rim of the flywheel, the motor may always be started from the seat through the medium of the side lever. An interlocking device connected with the spark advance eliminates all danger of a back fire.

Certain to command attention is the effort of the Gyroscope Automobile Co., of New York City, in so far as its efforts at the show are to be noted, lies in the 16-horsepower "friction" drive model of that make, the same fitted with a roadster body at \$750, or a touring body at \$800, and other options at the behest of patrons. This model weighs 1,500 pounds, is a ball and roller bearing proposition, and has its range of distinctive features, among which it may be well to call attention to the thermosyphon cooling, including a honeycomb radiator which takes care of the two-cylinder motor, the bore of cylinders being 4 1/2 inches and the stroke is the same. The car is of the shaft drive, with channel section frame, and a 95-inch wheelbase with a standard tread accounts for the good road performance.

Inter-State.—With a 40-horsepower four-cylinder motor of a refined type, using a three-speed (and reverse) transmission among the features, the Inter-State Automobile Co., of Muncie, Ind., will court fortune at the show. Dwelling upon the one model, with nothing else to detract the attention of the designers, it has ended in a car such as can scarcely go through the show and fail to attract the notice of buyers of intimate knowledge of what a good automobile should be like.

Jackson.—As has been the case during the past year or two, the Jackson Automobile Company, Jackson, Mich., will devote its attention partly to the two-cylinder type and partly to the four, the complete line comprising seven different models, of which three will be equipped with the two-cylinder horizontal opposed type of motor, and the remainder with the four-cylinder vertical. Beginning at the bottom of the list there is the Model F runabout, a 16-18-horsepower machine, with a twin cylinder motor listing at \$850; Model K consists of the same chassis with a regulation type of touring body, the selling price of the car thus equipped being the same; Model C is a five-passenger touring car of the same type, but its two-cylinder engine is larger, being rated at 20-24 horsepower. There will also be two four-cylinder machines turned out, the smaller being a 30-horsepower car listing at \$1,600, while the larger is a 35-horsepower car selling at \$2,000, each being shown in touring and roadster bodies.

Kisselkar.—There is no less than three models listed by the Kissel Motor Car Company, Hartford, Wis., for 1909. Two of them are new and one is an eye-opener in the shape of a 30-horsepower model, listing at \$1,500. It is practically a replica of the higher-priced machine, the performances of which, both in contests and in the hands of numerous private owners, served to make the Kisselkar reputation the country over in the course of a single season. Probably its most distinctive feature, where the power plant is concerned, is the dual ignition system, consisting of an Atwater Kent timer and dry cells on one side, and a Remy high-tension magneto with single vibrator coil on the other, both sets operating with independent plugs. The other two models are the 40-horsepower four-cylinder type, which is a continuation of last year's model of the Kisselkar, with a number of improvements, prominent among which may be mentioned the adoption of 36-inch wheels, instead of 34, while the other is a 60-horsepower, six-cylinder car. All embody numerous features of design and construction that make them noteworthy productions at low figures.

Lambert.—Friction drive is the chief distinguishing feature of the Lambert cars, manufactured by the Buckeye Manufacturing Company, Anderson, Ind., although they embody numerous other



points of design and construction that have been worked out by their builders during the several years that this car has been on the market. For the 1909 season, they will be shown in a greater range of sizes and prices than ever before, beginning with the Model A-1, three-seated, 20-horsepower runabout, listing at \$800, and ending with the Model B-2, 35-40 horsepower, seven-seated touring car, which is being placed on the market this year at \$2,000. Between these two, there are three different models, a touring type on the 20-horsepower chassis, and four and five-passenger cars on the 28-horsepower chassis. With the exception of the smallest, which is equipped with a horizontal opposed type of engine, a four-cylinder vertical motor will constitute the Lambert power plant. The Lambert friction drive, giving a universal range of speeds, is employed on all the models in question.

Lane Steamer.—For 1909 there will be two of the Lane steam chassis listed, one rated at 20 horsepower and the other at 30 horsepower. On the former there will be shown a three-seated roadster type priced at \$1,800, and a five-passenger touring car, listing at \$2,000; while on the larger chassis there will be a Lane roadster at \$2,800, a close-coupled four-passenger car at \$3,000, and a seven-passenger touring car at \$3,100. The features that have always characterized Lane construction during the past nine years have been retained, the power plant consisting of the combination fire-tube and coil generator under the bonnet, at the forward end of which the condenser is carried, while the engine is a two-cylinder compound placed in a sloping position under the footboards and driving to the rear axle by means of a single chain. A simplifying device is employed by means of which the high pressure steam may be employed in both cylinders when extra power is needed. The Lane Motor Vehicle Company, Poughkeepsie, N. Y., are the manufacturers, while the car is marketed by the Lane Sales Company, 2637 Broadway, New York.

Marion.—Numerous excellent features of design characterize the Marion motor and, needless to add, these will be continued in the 1909 models of this car, which is manufactured by the Marion Motor Car Company, Indianapolis, Ind. The cylinders are cast independently, and are of the T type, having the valves oppositely disposed in outboard ports; two camshafts are used, the valves being operated by the direct thrust method. The gear pump for circulating the water and the ignition timer are both located on the forward end of the motor in accessible locations. The carburetor is a Schebler with automatic piston throttle, while high tension ignition is employed, a six-volt sixty-ampere hour set of storage cells supplying the current, with a set of dry cells for emergency use, on the four-cylinder Marion, while a magneto will be specified on the six-cylinder car. The clutch is of the multiple disc type, while the change-speed gear is a selectively operated sliding set.

Marmon.—For the coming season the Nordyke & Marmon Company, Indianapolis, Ind., will place on the market the most extensive range of models that they have ever attempted. They will build three distinctive chassis, namely, the 32-40-horsepower, 40-45-horsepower and 50-60-horsepower types, all of which will be equipped with four-cylinder motors. It is hardly necessary to add that those characteristic features of design and construction that have always served to place the Marmon product in a class of its own will be perpetuated in each one of the new models for 1909. Probably the most striking of these is the Marmon flexible running gear, by means of which a double three-point suspension is obtained, the power-plant and drive being supported on one member and the body on another, thus making either free to move according to the nature of the road surface. This prevents the severe binding and twisting strains imparted to the frame and body from reaching the power-plant or any one of the links in the transmission. The Marmon separable head water-cooled cylinder casting is also a striking feature of the Marmon power-plant.

Maxwell.—The new Maxwell runabout at \$500, which is practically a replica of its confreres of the same name on a

smaller scale, is the only addition to the Maxwell line for 1909, but it will be turned out in quantities, the company planning to build no less than 5,000 of these small cars during the coming season. The three models listed last year will be continued in substantially the same form. These include the Maxwell Model L B, which is a 14-horsepower runabout with a two-cylinder horizontal opposed type of motor, multiple disc clutch, and shaft drive, a two-speed planetary change gear set being employed. One of the features of this car not hitherto included as a part of its standard equipment will be a high tension magneto for ignition. Next to this size comes the Maxwell HD, a 20-horsepower touring car listing at \$1,450. It is also equipped with a horizontal opposed type of twin-cylinder motor and multiple disc clutch, but has a three-speed sliding type of gear-set. Model KA 25-30-horsepower, four-cylinder car, shown in both touring and runabout types, completes the Maxwell line.

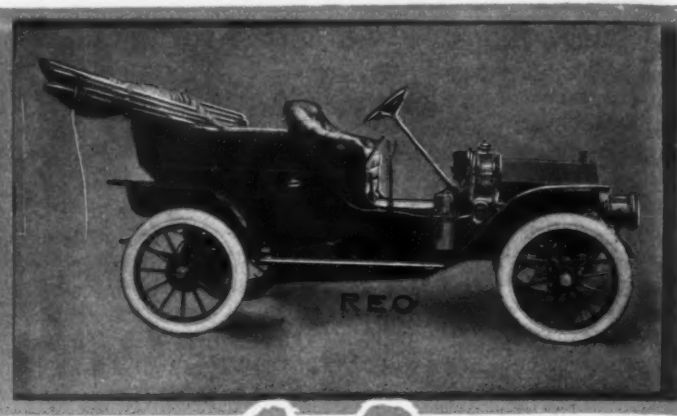
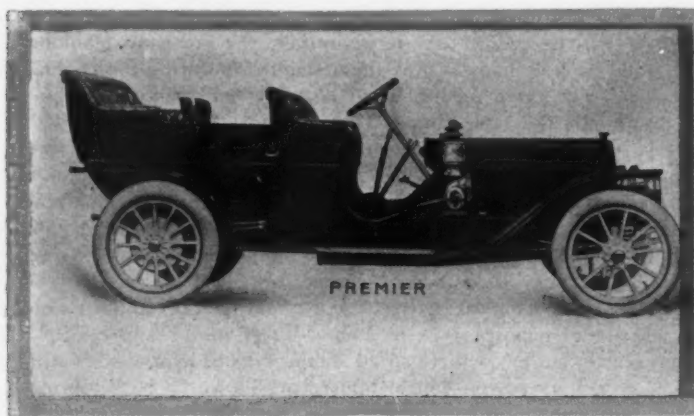
McCue.—This is the product of the McCue Company, of Hartford, Conn., and the patrons of the industry are justified in the interest they take in the McCue 30-horsepower model at the show. This car has a four-cylinder motor with double ignition—Bosch magneto and battery—selective type transmission, floating type rear axle, I-beam front axle, artillery wheels with 36 by 4-inch tires, and actually weighs 2,020 pounds. The wheelbase is 117 inches, track 56 inches. The engaging of this concern in automobile construction is considered significant, its previous energies having been greatly connected with the horse and carriage trade.

Middleby.—This product comprises two models from the point of view of immediate interest, as it centers around the show. Both the Model A and B have a 25-horsepower motor, and the transmission is with three speeds, as well as a reverse to be sure. The motors are of the four-cylinder type, and the design, material, and workmanship is up to a high standard. Both models sell for \$850. It is the Middleby Auto Co., of Reading, Pa., that turns out this line of cars.

Midland.—The Midland Motor Car Company, Moline, Ill., will list two models for the coming season, one a 25-30-horsepower car and the other a 35-horsepower machine. The former is known as Model E, and is equipped with a four-cylinder vertical motor, the dimensions of which are 4¾ by 5 inches, while the latter is termed Model G and has a 4¾ by 5¾-inch motor. Model E has been designed to sell at \$1,800, but it embodies many features of higher-priced machines, such as the three-speed selective change speed gear. It has a disc clutch, nut and screw type of steering gear, two sets of brakes on the rear wheels, and is equipped with 34 by 3½-inch tires all round. The wheelbase is 110 inches. Model G is a larger car listing at \$2,250, and is shown in both touring and roadster types. Its motor dimensions are 4½ by 5¼ inches, developing its rating of 35 horsepower at a moderate speed. The remainder of its design is along practically the same lines as the smaller car, but proportionately larger, the wheelbase being 112 inches and the tire equipment 34 by 4 inches all round.

Moline.—For the 1909 season the Moline line, made by the Moline Automobile Company, East Moline, Ill., will be composed of two four-cylinder chassis, the smaller of which lists at \$1,500 as a touring car, while the larger will be shown both as a runabout and touring car at \$2,500. The power plant of the smaller car is rated at 24 horsepower, and embodies all those features of design and construction that have characterized the Moline cars during the past two or three years and that have done so much to contribute toward Moline success. This machine will be known as Model M. Model K is a 35-horsepower car, which is shown both as a three-seated roadster and as a five-passenger touring car, and while its specifications show it to be substantially a continuation of the Moline chassis of 1908, detailed improvements have been made in a number of instances, while both so far as its accessories and the materials and workmanship employed in its construction are concerned, it represents a much higher value at the price than before.

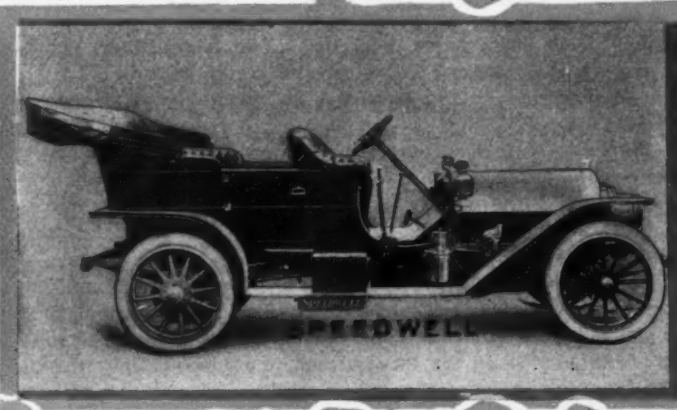
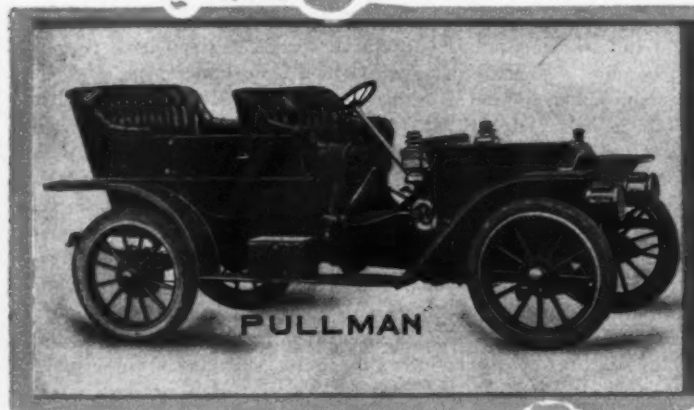
Mitchell.—The Mitchell Motor Car Company, Racine, Wis.,



will devote its entire energies to the production of three models during the 1909 season, beginning with a four-cylinder 4 by 4-inch, rated at 20 horsepower, listing at \$1,000 as a two-seater and known as Model J, and ending with the 35-40-horsepower Model L Mitchell, listing at \$2,000. Intermediate these two, there is Model K, which is a 28-30-horsepower car designed to sell at \$1,500. It is fitted with a five-seated body of the touring type, but having a detachable tonneau so that it may readily be converted into a runabout. Its motor dimensions are 4¼ by 4½ inches; ignition is of the high tension type employing a magneto with dry cells for emergency use and a cellular radiator is fitted. The clutch is a conical type driving through a three-speed select-

known as Model D, which lists at \$3,500. As a roadster, with a toy tonneau, or with the regulation touring type of body, it will be known as Model C and will list at \$1,000. Some of the distinctive features of design of the Moon are the overhead camshaft with oppositely disposed valves in the cylinder heads, an arched type of rear axle, permitting the driving wheels to be set slightly off the vertical plane, something that has only been possible hitherto with the side chain driven type of car. Annular ball-bearings are used throughout the gear-set and rear axle driving unit, a triangular form of torsion rod being employed to relieve the latter of stresses.

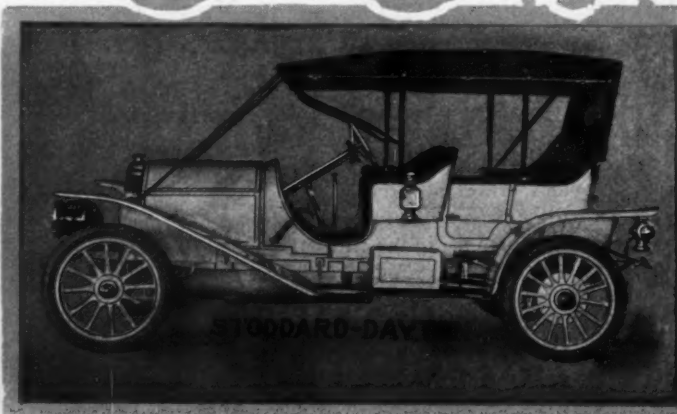
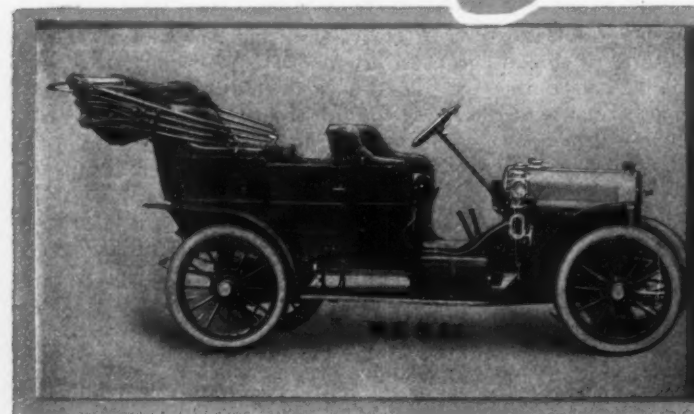
Mora.—With a view to meeting the demands of the great-

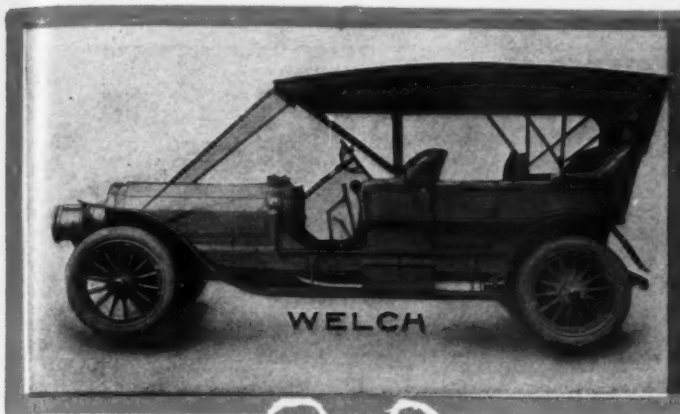


ive gear by shaft to the live rear axle. The wheelbase is 105 inches and the tire equipment 32 by 4 inches all round. Model L Mitchell has the same features of construction, but is on a larger scale, the wheelbase being 122 inches, while the tire equipment measures 34 by 4 inches, the car being a seven-passenger touring type.

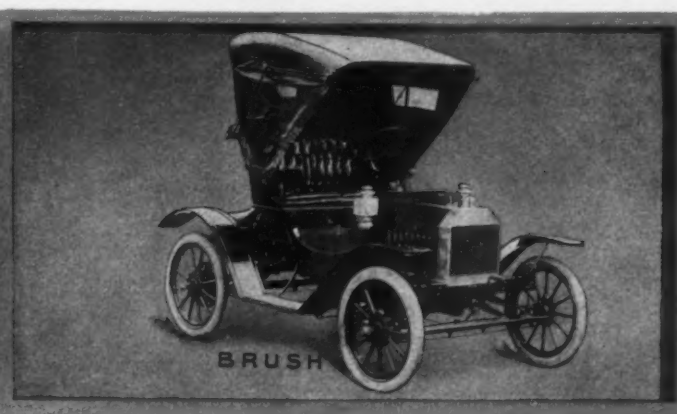
Moon.—Adhering to its past policy of devoting all its energies to the production of a single type of chassis, the Moon Motor Car Company, St. Louis, Mo., will feature the 30-35-horsepower car which is substantially the same as its predecessor for 1908. But it will be shown in four models, ranging from the three-seated roadster up to the seven-passenger touring car,

est number of purchasers, the Mora line for 1909 will comprise a "Light Four" and a "Light Six," in addition to a more powerful four-cylinder car, each one of three being shown with different styles of bodies, including the "Racytype," so that there will be an extended range to choose from. The Mora Motor Car Company, Newark, N. Y., has been increasing its facilities considerably during the past few months and plans have been made to turn out a much larger number of cars for the 1909 season than ever before. Like their predecessors, they will be characterized by those features of design and construction that have served to make the Mora distinctive since its inception. Chief among these is the Mora unit power plant, the motor,





WELCH

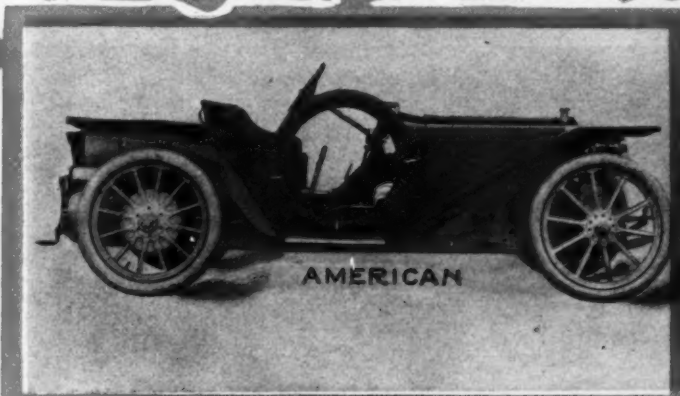


BRUSH

clutch and gear-set being mounted directly upon a cast aluminum alloy supporting pan, which is bolted directly to the side members of the frame.

National.—This is the car that was made famous by the world's 24-hour stock car record and the happy phrase, "Watch for the Round Radiator," which latter phrase has not been given much publicity of late. However, this ball-bearing car of the National Motor Vehicle Company, Indianapolis, Ind., is just as good in every detail as when it made the 24-hour record. The ball-bearing feature is one that the company has much faith in, and it is retained in toto in the new models. This means that not only the crankshaft and both camshafts but also

bow to the public at the shows last year, will be continued in three different models for the coming season, the leader of the Oakland line will be a 40-horsepower, four-cylinder car, upon which Designer Alanson B. Brush has been working during the past summer. Although rated at 40 horsepower, it will not tip the scales above the 2,000-pound mark. Its motor has twin cylinder castings measuring 4 1-2 by 5 inches, the valves all being on the same side. A specially designed carbureter, a mechanical force feed oiler, centrifugal pump, and a storage battery working through the usual low-tension timer and coil constituting the accessories. A high-tension magneto is fitted as an extra. Roller and ball bearings are used throughout the



AMERICAN



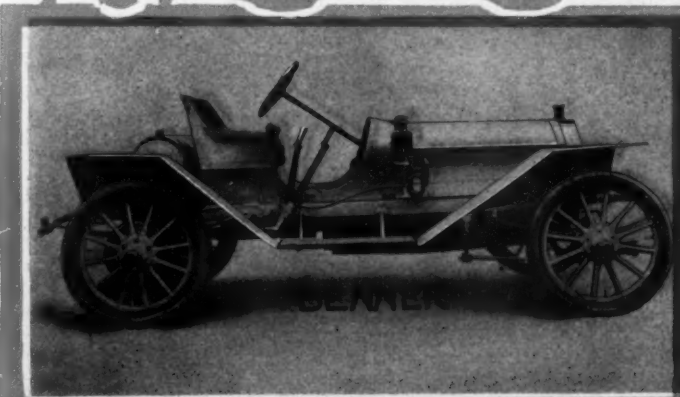
ANDERSON

the transmission shafts, propeller shaft, all wheels, magneto shaft, practically every rotating part, will run on these friction reducers. As it has been ascertained that these bearings consume but 1-8 of 1 per cent. of the power delivered to them, this makes a very high-powered car, comparatively speaking, out of one with a medium sized motor. The power delivered at the rear wheel being such a large percentage of the motor power, a car thus equipped has a lesser weight per effective horsepower, which is a desirable feature.

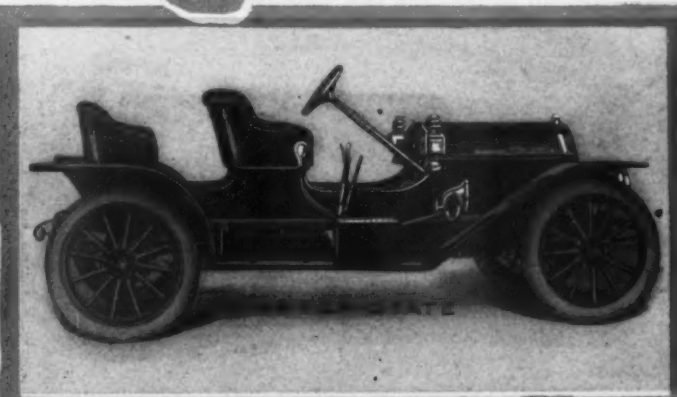
Oakland.—While the two-cylinder vortical 20-horsepower Oakland car with the special balancing system, with which the Oakland Motor Car Company, Pontiac, Mich., first made its

chassis construction, the motor bearings being plain and very liberal in size. This also applies to the tires, which will be 34 by 4 inches all round.

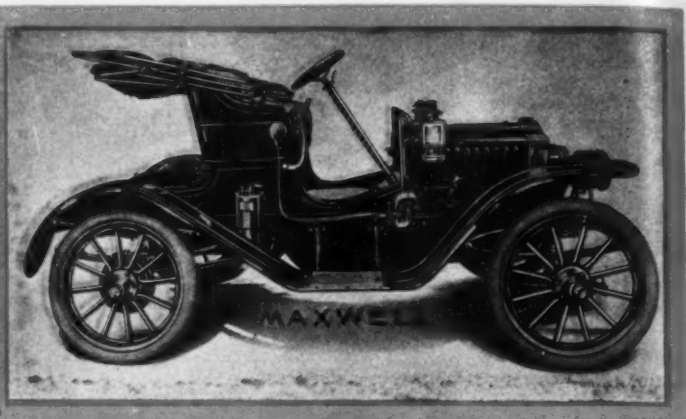
Overland.—Prominent as a leader of the Overland line for the coming season will be the Model 30, which is a 30-horsepower car equipped with a four-cylinder 4 by 4-inch motor, Remy magneto, thermo-syphon circulation, tubular radiator, force-feed lubrication, cone clutch, shaft drive, and two-speed planetary change-gear set located at the rear axle. A worm and sector type of steering gear is employed and the wheelbase is 108 inches. As a runabout this car is listed at \$1,250, while as a four-passenger car the price is \$1,300. A distinguishing feature



GENNET



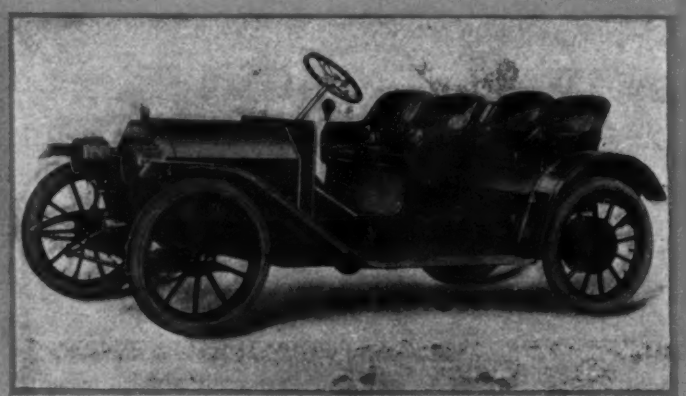
OVERLAND



of the Overland 32, listing at \$1,500, is its unusually liberal tire equipment for a car designed to sell at this price, as it is fitted with 34 by 3 1-2-inch tires all round. Its motor is slightly larger than the Overland 30, having a 4 1-2-inch stroke instead of 4-inch, the bore being the same. The change-speed gear is a selective sliding type giving three forward speeds. Listing at \$2,000 is the Overland 34, the motor of which has 3 1-2 by 4 1-2-

will list at \$2,000 and \$2,100, according to size. The Model C, 50-horsepower car will be shown in runabout and touring types at \$3,000, while a specially designed six-cylinder car, to be known as Model E, will list at \$3,800.

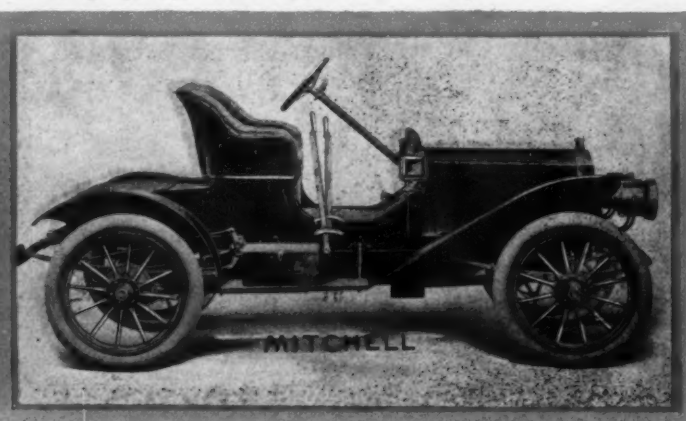
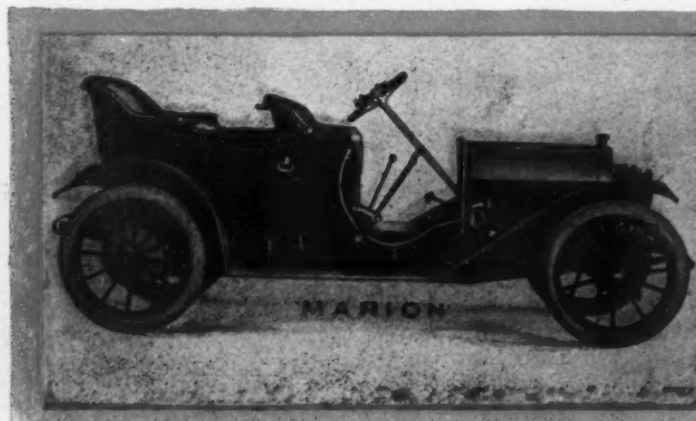
Premier.—There will be two "fours" and two "sixes" in the Premier line for 1909, representing respectively the roadster and touring types built on each chassis. Of the latter, the Premier Model 30 is a 30-35-horsepower car listing at \$2,500. Its cylinder dimensions are 4 1-2 inches square, the length of the stroke being the same as the diameter of the bore, while in its design and construction the power plant is characterized by those features that have become familiar in the past year or two as being identified with the Premier. A multiple disc type



inch cylinders and is rated at 35-horsepower. It is fitted with a three-speed selective gear, and a high-tension magneto is included in its regular equipment.

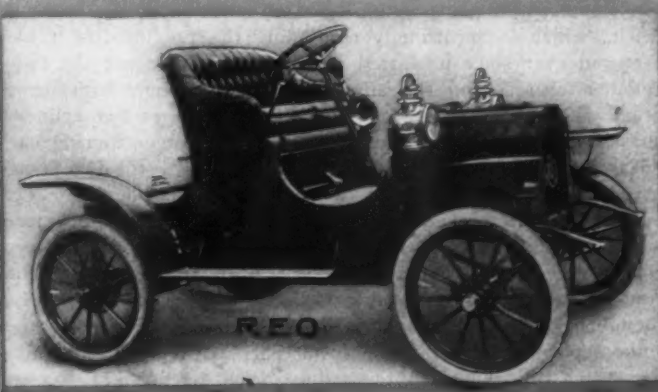
Pennsylvania.—For the 1909 season the Pennsylvania Auto Motor Company, Bryn Mawr, Pa., has brought out a replica of the Pennsylvania 50-horsepower car that has been so successful during the past two or three seasons. The new car is about half the size of its predecessor where power is concerned, and will be known as the Pennsylvania "Twenty-five," or officially as Model D. Its rating under the A. L. A. M. formula, however, is 28.8 horsepower, which shows that its title is only a nominal indication of its ability in this direction. While it has been brought out to meet the demand for a small car, no attempt has been made to meet low-priced competition, everything about its design and construction being carried out with the same painstaking care that has always characterized its larger predecessor. It will be shown in two, four and five-seated types and

of clutch is employed in connection with a three-speed change gear acting on the selective principle, with final drive by shaft. As a roadster the Premier 30 will have a 114-inch wheelbase, while its tire equipment will consist of 34 by 3 1-2-inch tires front and 34 by 4 rear. The Premier 35, which is equipped with a six-cylinder 45-55-horsepower motor, lists at \$3,500. Its cylinder dimensions are the same as the smaller car, the extra pair of cylinders accounting for its higher rating, while it also has the same features of design, such as the three-speed selective gear and shaft drive. The Premier is marketed by R. M. Owen & Company, 1757 Broadway, New York City.





OVERLAND

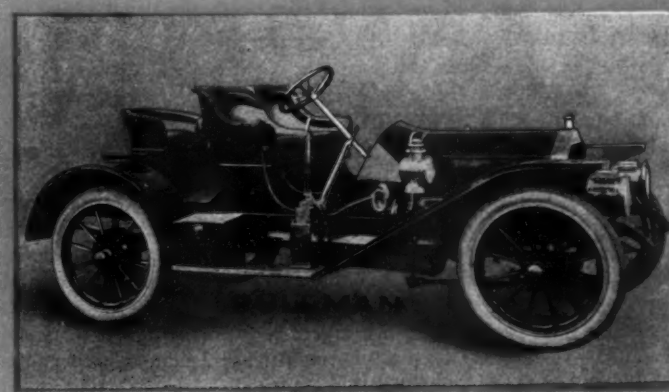


REGAL

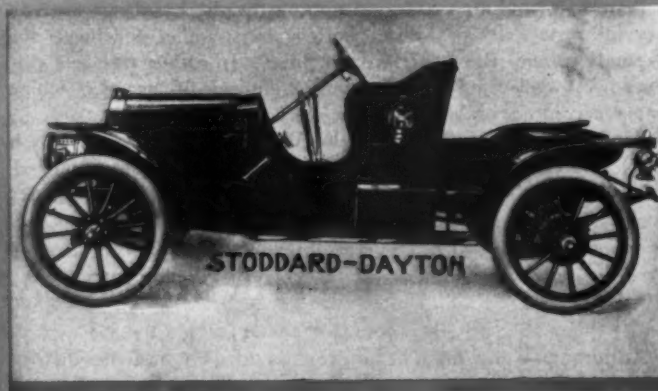
Pullman.—With everybody talking of small cars and preparing to build small engines, it must be a pleasure to be able to say truthfully, "I told you so," and back it up by several years' production of small motors. This is the unusual position in which the York Motor Car Company, York, Pa., finds itself to-day, having built a 3 3-4-inch by 3 3-4-inch four-cylinder motor for the past three or four years; a "six" 3 3-4 by 3 3-4 for two years, and a "four" 4 1-2 by 4 1-2, 4 1-2 by 5 1-4, for a similar length of time. Now another taxicab model is announced, having a four-cylinder 3 7-8 by 3 7-8 engine. This makes a total of five distinct engines by this firm, all 5 inches or smaller in diameter, and three of them are less than 4 inches in diam-

of cars apparently embracing everything that has a place in automobilism.

Regal.—There are not many cars on the market at anything like the price of the Regal that can approach its value, which becomes evident upon an inspection of the car itself, in the shape of the care taken in the elaboration of the details. For instance, the valves are actuated by roller tappets—a feature not to be



STODDARD-DAYTON



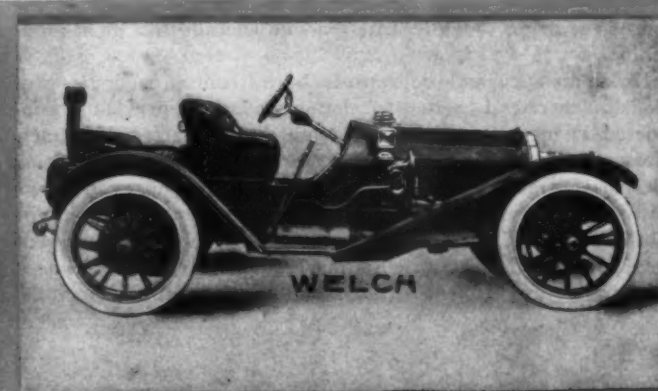
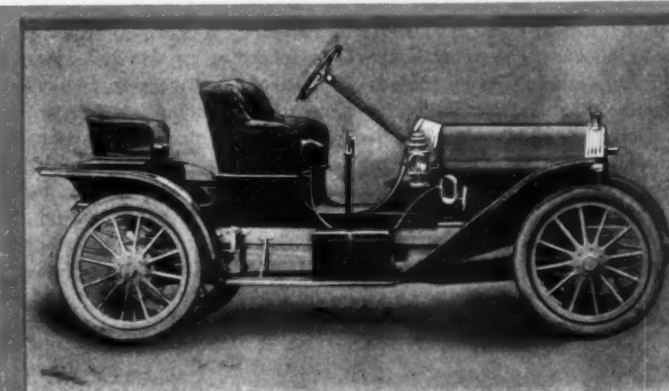
WELCH

eter. This long and varied experience in small motors should have given this company a large and commanding lead in this now popular form of construction.

Rambler.—The Thomas B. Jeffery Company, Kenosha, Wis., will not exhibit at the Palace, but will entertain friends and patrons at the New York City branch showrooms, 457-459 Broadway, at which place the entire line of the company can be shown to better advantage than would be possible in a place not devoted to the undivided "Rambler" interest. For 1909 the company is in a position to enhance an already secure reputation with a line

found on many higher-priced cars. The motor is a 4 by 4-inch twin-cylinder type, the design of which has been well worked out. Its accessories consist of a McCord radiator, circulation being on the thermo-syphon principle through unusually large connections, a Buffalo carburetor, and a Remy high-tension magneto operating through a single coil on the dash. An emergency ignition system is provided by means of a set of dry cells, the magneto distributor being common to both systems. The self-contained oiling system is a valuable feature. It consists of a gear pump at the lower rear right-hand corner of the aluminum oil pan. This draws its supply from the lowest part of the pan and discharges it into a tube running parallel with the crankshaft. It is drilled with a number of holes through which the oil is squirted out on the bearings. The Regal Motor Car Company, Detroit, Mich., are the builders.

Reo.—"Greater value for the money" rather than any



radically new models or changes in design may be said to concisely sum up the plans of the Reo Motor Car Company, Lansing, Mich., which is accordingly continuing the two models it has featured ever since it started in business. These are the two-cylinder chassis and the single-cylinder runabout, both being fitted with horizontal motors. The 20-horsepower two-cylinder chassis will be fitted as a regulation five-passenger touring car, or as a roadster with a folding rear seat, the list being \$1,000 in either case, instead of \$1,250 as last year, although the car has been improved and has been given several inches more wheelbase than formerly, thus making the tonneau much more comfortable. A similar cut has been made in the case of the runabout, which is now listed at \$500 instead of \$650 as formerly, though it has been similarly improved. In the case of the 20-horsepower roadster, a top forms part of the standard equipment and is included in the selling price given. The Reo is handled by R. M. Owen & Company, 1784 Broadway, New York City.

Speedwell.—The Speedwell Motor Car Company, of Dayton, Ohio, is putting forth its efforts for 1909 in the pleasure car line by producing three models of 40 horsepower each, the same motor being used in each case. The touring car and runabout list at \$2,500 and the limousine at \$3,500. The transmission is of the selective type, provided with three speeds and reverse, the power being transmitted to the rear wheels by propeller shaft and live axle. Ample foresight has been used in providing two sets of brakes, both acting on the rear hubs, one expanding and the other contracting. In other respects the Speedwell conforms to a certain standard of practice which has received favorable mention on notable occasions.

Stoddard-Dayton.—Among the Western products to which that Western phrase, "Bright and breezy," may be employed, as indicating that they are always in the front rank and always

right up to date, is the product of the Dayton Motor Car Company, Dayton, Ohio. For 1909 three bright and breezy right up-to-the-minute chasses will be built, furnished with a full range of suitable bodies. The chasses will have 25, 35 and 45-horsepower motors, all of the four twin-cylinder vertical type. These vary in price upward by steps of \$500, the 25-horsepower car being low at \$1,500. Despite a fire in its plant, the company bobbed up serenely with a very large production for the past year, and a still larger one promised for 1909. The smallest car has been redesigned, and with a larger and more powerful motor comes into the so-called "1,500" class, which is distinctly a Middle Western clan. But if the Middle West produces this line of cars it is a fact also that the East gets away with a lot of them. The Stoddard-Dayton is one of the cars that is much to be seen on the streets of the big cities all over the East, and it is to their credit to say they are popular in the extreme.

Welch.—Pioneer is a good word to apply to this Michigan product of a Pontiac shop, the Welch Motor Car Company, for the Welch Bros., designers and manufacturers of this car, produced in 1904 many forms of construction which are to-day considered absolutely correct. Thus this firm were pioneers in the production of the multiple disc clutch running in an oil bath, the truss reinforcement for the narrowed frame, the overhead valves and camshaft, and the completely finished spherical combustion chamber. The latter, featured by this firm for the past four years, is now accepted "on the Continent" as the form for racing cars, and, accordingly, all Continental racers are so equipped. The Welch company has gone one step further and applied this theoretically and practically perfect cylinder arrangement to all cars built by them. These will consist of two chasses, one four and one six-cylinder, with the usual range of bodies for each.

THE AMERICAN BUGGY TYPE

Anderson.—The present interest is in two models, one of which is fitted with solid tires and the other with pneumatics. Both models are provided with a 12-horsepower motor of the two-cylinder type, more complete data of which will be found in the general tables devoted to the subject. Model B has a three-speed transmission, while model C is with a two-speed transmission. In all respects the cars as made by the Anderson Carriage Company, of Anderson, Ind., will be capable of holding a prominent place in the hearts of users. The company realizes the need of a stable product in the class of trade to which they by the excellence of their wares claim the right to cater to.

Chicago.—Three two-cylinder and one four-cylinder model will comprise the main output of the Black Manufacturing Company, Chicago. Model 12 is a 14-horsepower car, seating two persons, selling at \$450, which in itself will be something to take into account by the purchasing public. All the models, excepting the 40-horsepower four-cylinder car, are fitted with a two-speed transmission, while the 40-horsepower model has a three-speed transmission. This latter model sells at \$1,250, and by this fact it will be rendered manifest that the company proposes to cater to popular trade, which, in view of the size and quality of the car, at the price, should realize that the Chicago is a good proposition.

Holsman.—Radical departures both from precedents previously adhered to by its own designers, and from what is considered as more or less standard practice, characterize the new Holsman for 1909, the improvements in its engine design being such that its makers, the Holsman Automobile Company, Chicago, Ill., feel justified in terming it the "simplest automobile in the world." It has a four-cylinder air-cooled motor rated at 26 horsepower, which, however, is much simpler and more compact than the former Holsman motors of half its rating. It is dis-

tinguished by the use of anti-friction bearings throughout, either Hyatt roller-bearings or ball-bearings being employed, even on the connecting rods, which are of an entirely different type from the ordinary. Short pistons similar to those customary in steam practice are employed, and each pair for the horizontal opposed cylinders are rigidly fastened together. One of the new types listed for the coming season is termed the Holsman "Gentleman's Automobile," being an enclosed buggy type.

Kiblinger.—What is probably one of the most extensive lines of the high-wheel type of automobiles to be shown by a single house is now being listed by the W. H. McIntyre Company, Auburn, Ind. While nominally termed "high-wheelers," the Kiblinger cars are in several instances mounted on running gear having wheels as low as 34 inches, but the latter are of the buggy type and are shod with solid tires. With the exception of the Model M, 27-horsepower car, which is equipped with a four-cylinder motor of the vertical type, all of the Kiblinger models are fitted with two-cylinder horizontal opposed motors. The latter are in two sizes, four models being fitted with 16-horsepower motors, and three with 13.5-horsepower motors, all being air-cooled. The planetary type of change-speed gear giving two speeds forward and reverse is employed in every case, the different models ranging from \$450 to \$750, according to size and power. Their seating capacity ranges from two passengers in the case of the runabout up to six in the case of the surrey.

Schacht.—The model K is an 18-20-horsepower car with a two-cylinder motor, and the scheme of transmission affords five speeds. The price of the car is \$680, which is low enough to reach the pocketbook of the most conservative buyer, and it is pretty generally understood that the cars of this make are quite up to a fitting standard. The Schacht Manufacturing Company, of Cincinnati, Ohio, is the maker of the cars.

EUROPEAN CARS IN AMERICAN DEMAND

NO plans having been made for holding an "Importers' Salon" this year, the representatives of European manufacturers in this country decided to cast their lot with the "Independent" American makers, and are accordingly holding forth in the Palace show. Influences responsible for the growth and sale of American cars have likewise worked a revolution in the demand of the American market for the imported car. At the outset, the importers had the field without much interfering competition; there was not an American car that could stand comparison with the product from abroad for the moment and importing flourished accordingly. Conditions have changed rapidly since then, and with each succeeding year the United States has become a more and more difficult market for the imported car. But despite the fact that America now annually turns out by far the greatest number of automobiles produced by any one country

and exports no small percentage of them, it offers a market so wide that there is still room and to spare for the foreign manufacturer to dispose of a percentage of his product.

But the European must be prepared to meet strenuous competition, and in order to succeed in this must do business *à la Américaine*, if he would dispose of any considerable fraction of his output on this side of the Atlantic. In other words, the time has come when the business of importing foreign automobiles and selling them here has come down to a business basis, and those importers who are desirous of continuing as such have found it necessary to realize this fact and guide themselves accordingly. Otherwise the inexorable mill of competition will surely eliminate them, just as it has numberless American concerns whose backers had small knowledge and no experience of the requirements of successfully marketing automobiles.

Benz.—The makers of the Benz can doubtless lay claim to being the oldest manufacturers of automobiles extant, and were responsible to a great degree for its development in earlier days. It has only been within the past year or so, however, that they have made any attempt to enter this market, the Benz Auto Import Company of America, New York City, now being the agents on this side of the Atlantic. The showing in the Grand Prix of the A.C.F. and its excellent performance in the Savannah event, in both of which races it scored a very close second, have served to bring the Benz into considerable prominence, so that the models on display at the Palace will doubtless be inspected with more than passing interest. The German manufacturers plan to make a strong bid for American business, so that the local branch's exhibit includes quite a showing of models.

C.G.V.—The Charron, or C.G.V., as it is more familiarly known, was one of the first French makes to come into this market, where it has been a factor of importance ever since. A large number of these cars have been imported during the interim, but they have never been shown in such a wide range of models as now are to be seen at the Palace. In fact, the C.G.V. Import Company, the New York agents, can probably lay claim to the distinction of showing both the smallest and largest cars on the floor, as their line begins with an 8-10-horsepower model listing at \$2,500 and ends with a 90-120-horsepower chassis listing at \$10,000. Between these two extremes, the lowest of which represents a two-cylinder town car, there is a range sufficient to meet every demand. For instance, there are 12-15, 15-20, 20-30, 30-40, 50-60 and 75-90-horsepower models, all being equipped with a four-cylinder type of motor. The 12-15-horsepower model is shown complete with body in two types, listing at \$3,000 and \$3,250, the remainder being listed as chassis alone.

De Dietrich.—The De Dietrich Import Company, New York agents for this car, show a line of models, which, like most of their competitors, runs largely to small powers, for the French maker has awakened to the possibilities of the small car in no uncertain manner during the past year, and instead of devoting his attention to one or two high-powered types, is now in a position to meet the wants of the purchaser of a car of almost any size, from the smallest to the very largest.

DeDion.—The name DeDion is associated with the earliest appearance of the foreign-made automobile in this country, and for the first two or three years not a few machines of this make were sold in this country, though they were principally of a voiturette type which has since completely disappeared. During most of the interim the company has not been actively represented here. The De Dion-Bouton Selling Branch, 32 Cedar street, New York, is now the American agency for this car.

Delaunay-Belleville.—Up to within the past year or so this was a car which, though bearing an excellent reputation

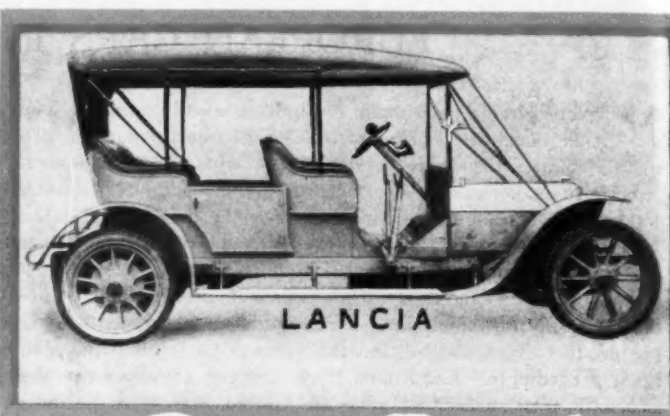
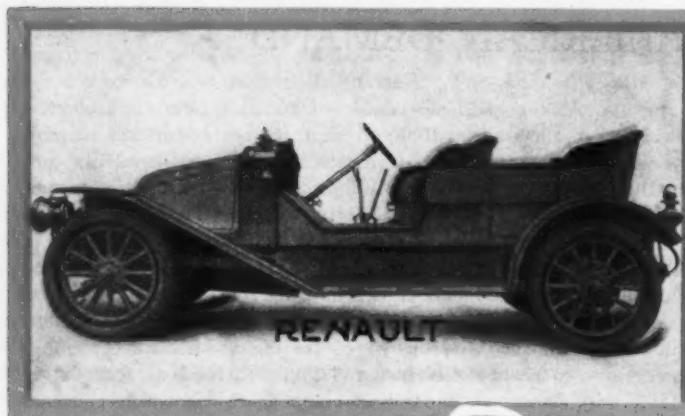
abroad, was very little known here. Brewster & Company, New York, the old-established carriage house, has recently taken the American agency, and are showing one or two models, which will be supplemented later by a more complete range of powers.

Fiat.—The importers of this car, the Fiat Automobile Company, New York City, will have an ample line to choose from during the 1909 season, the models ranging in power from a four-cylinder 12-horsepower car up to a 60-horsepower model of the same number of cylinders, or a 45-horsepower six-cylinder type. In all there are no less than seven models, the chassis prices ranging from \$2,750 to \$7,250.

Hotchkiss.—The Hotchkiss Import Company, New York, American agents for the well-known French artillery makers, will put forth a greater effort for business in this country during the coming year than previously, as is shown by its exhibit. The company is one of the first import agents to adopt the American plan of listing its cars complete with body.

Isotta.—In order to be in a position to meet the demand for an extended range of powers, the Isotta Import Company, New York City, American agents for the Italian builders of the Isotta, is showing a line of models from 14 to 50 horsepower. These are the 14-20-horsepower chassis listing at \$4,250; 18-24, listing at \$4,500 and \$4,600, the latter having a slightly longer wheelbase, but being otherwise the same; the 15-25-horsepower at \$5,250; the 40-45 at \$5,600 and the 50-65 at \$8,500. With the exception of the 15-25-horsepower model, all are four-cylinder types, the latter being a six. This car has placed itself so prominently before the public, through its highly consistent performance in every racing event in which it has been entered, that the features of its design have become so well known as to scarcely call for comment.

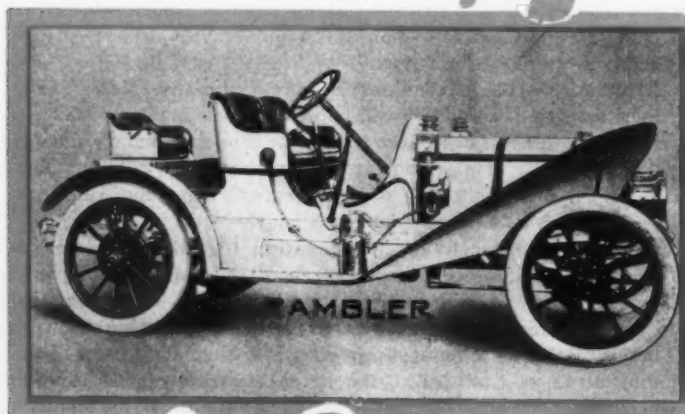
Lancia.—Italy has always had to look beyond her own confines for an extended market for her automobile products, and the United States have provided no small outlet for Italian cars in past years, so that it is quite natural that this new creation from the works of a racing pilot who is as well known and liked here as in his own land should be popular in the American market. But even had the car not his prestige to back it, the manner in which the Lancia has performed wherever it has been entered in speed contests would have been more than sufficient to give its name far more than the ordinary prominence, for its work has shown unmistakably that for power, speed, endurance and regularity of running, there are few cars in its class that can approach it. At present the 12-18-horsepower and the six-cylinder chassis are being handled here by the Hol-Tan Company, 244 West Forty-ninth street, New York, which is the American agent. This department, in charge of Harry Fosdick, shows a line comprising several models, the foreign practice of selling the chassis and body separate being followed, although



models complete with bodies, such as the touring and town car types, are also listed. The 12-18 chassis lists at \$3,000; fitted as the "Lampo" racing car of Savannah fame at \$3,300, with a touring body the price is \$3,500 and as a town car, \$4,000. The six-cylinder chassis, the cylinders being the same dimensions as the 12-18, lists at \$3,500.

Mercedes.—The exhibit of the Mercedes Direct Import Company, New York City, is limited to a 35-horsepower shaft drive car, in relation to which the body is attracting notice. This body is styled a "double phaeton" landaulet, and is one of the first of the kind to come over. In outside appearance the car, enclosed, looks like an ordinary landaulet with an extension over

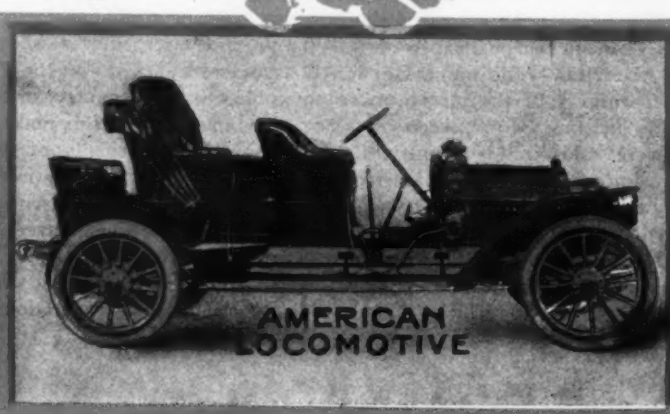
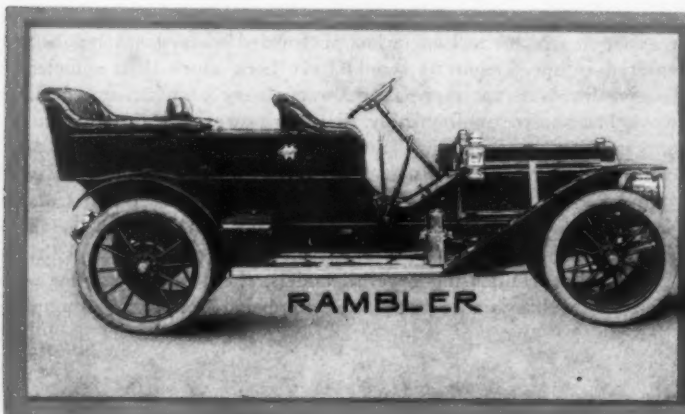
Renault.—Probably no foreign manufacturer has had such an excellent conception of the requirements of the American market as Renault Frères, and certainly none has always kept in such close touch with developments here. The Renault cars have always sold freely here ever since they were first introduced, and the company's interests grew to a degree of importance where a branch house became a necessity, this being the Renault Frères Selling Agency, at 1776 Broadway, New York City, of which Paul Lacroix is manager. Having a branch manager right in the field, this house has followed changing conditions as closely as any American manufacturer, and must be accorded the credit of being the first to realize that an extensive

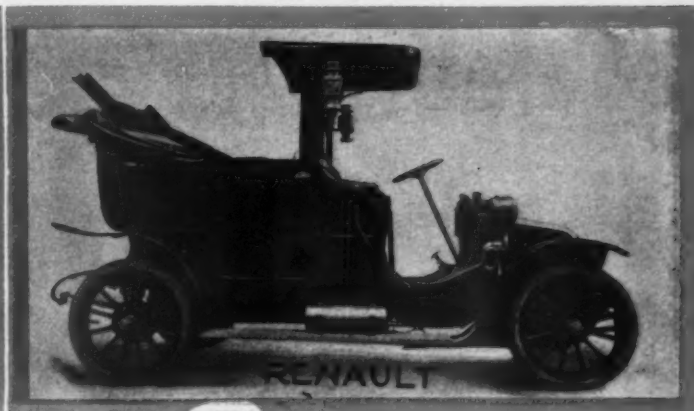
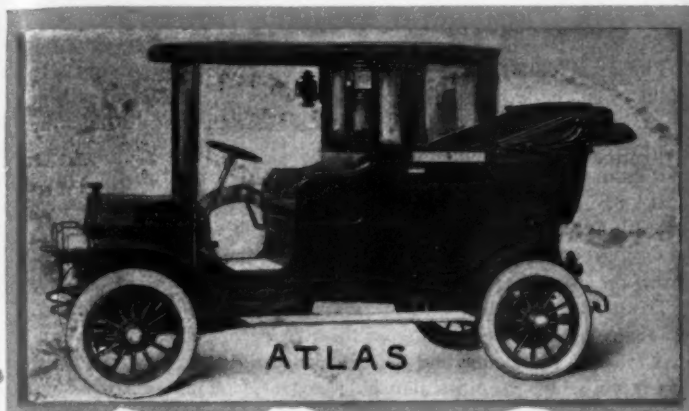


the driver and a glass front. However, the body is so built that it can be collapsed and it then takes on the appearance of a touring car. This is due to ingeniously folding the top and the dropping of the windows. Incidentally, the Mercedes as a shaft drive will make something of a commotion. The "Bosch" magneto is used on this car.

Panhard.—Never before has the Panhard been seen in this country in such a variety of models as are now on display by Panhard & Levassor, the New York branch house of the well-known French factory. These range from 8 to 80-horsepower and from two to six cylinders, though naturally by far the greater part of the showing consists of fours.

business could only be done here by following American methods. This the Renault Frères have done by bringing out types of chassis especially for this market and by establishing branch agencies in Chicago and San Francisco, showing in no uncertain manner that they are not only out for American business, but also that they know how to get it and will be in a position to take care of the goodly share that does come their way. The showing of Renault cars is one of the most complete lines of foreign cars staged at the Palace. They are also to be seen on the street and are known even by the "arabs" because of their distinctive appearance, the Renault front being quite different from cars in general.

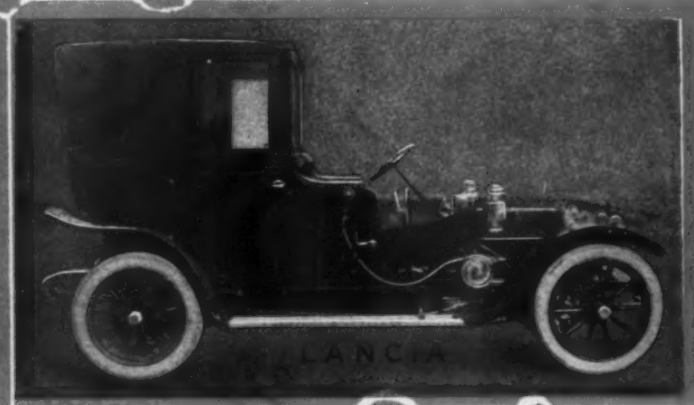




IN THE TAXICAB DIVISION.

This is a question that is not likely to run into models by the score, since in the service end individual buyers of taxicabs are few and they are more interested in specialized products, usually the outpouring of the older companies after they have satisfied their regular trade. Against this is the fact that some companies make a specialty of taxicabs from the start, never attempting to turn out anything besides. At all events, the situation as it presents itself at the show is one of the greatest interest, in view of the fact that taxicabs have proven to be of masterly commercial value, and the makers of cars, having tasted blood in the

wheelbase, nor high powered, since they are not geared to a high ratio, hence the power required is not nearly so much as that of the average touring car. But if the power is low in comparison it is a fact that the control is very perfect, and the cars of the class under discussion are very nimble indeed. Besides ease in handling, these cars are very simple in point of detail, and the labor that must be used in their operation seems to be able to cope with the problems in a manner less cramped than that attending the operation of touring cars. The taxicabs to be seen at the show do not represent all to be had, because it is usual to exhibit models of cars such as will be more likely to interest



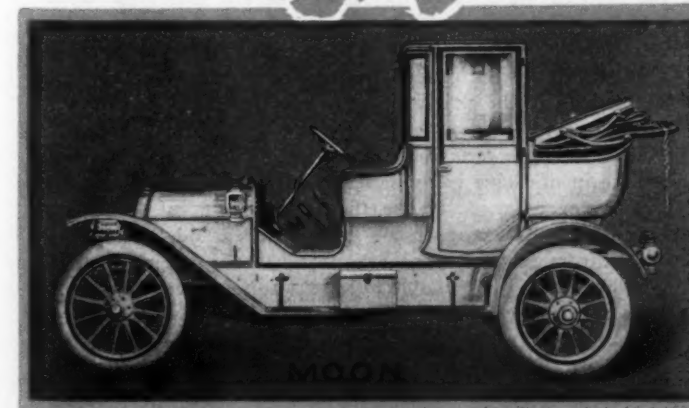
taxicab line, are after more, delivering quality in the cars as the incentive.

It was only a couple of years ago that the question was handled as a phase of the small touring car proposition, and even now it is not uncommon to observe examples of the converted touring car. It must be remembered, however, that touring cars are with a longer wheelbase than the same measure in taxicabs, rightly so, in view of the fact that the taxicabs have to make headway in congested streets, and this is not easy if the cars have a long wheelbase and the streets are narrow, as they are in many cases.

The trend is by way of taxicabs that are not with a long

the patrons in general rather than to attract the attention of the possible single purchasers of taxicabs.

But it would be an incomplete termination of the subject to fail to mention the splendid business that is directly due to this class of automobiles, nor will the traveling public fail to appreciate the means of transportation that enables them to combine business and pleasure. That the horse will have to go, is a matter too settled to require further discussion, unless it is to point out that in the taxicab will be found the most potent reason of them all. The earlier uncertainties were those involving the relative cost, which in the computation did not take into account the "radius of action" of the taxicab.





THE COMMERCIAL VEHICLE INDUSTRY.

The automobile industry has been called the most progressive industry in the world, but surely if this is to be taken literally it must have an addition so that it will read, "excepting only the commercial vehicle industry." If the latter could be separated out from the former it would easily be accorded the premier position. The little work that has been done in the past is, as one might say, only a drop in the bucket to what is being done to-day, while the latter in turn occupies the same position toward the future.

To-day any sub-division of this industry into clearly defined branches may be made, many of these being possible. These sub-divisions, in turn, may be selected at random and any one of them will show a most unusual progress. This progress has taken on various forms, to specify any one of which would be to delve into the minor details, which is not the purpose here. However, to generalize and at the same time be specific, the subject of motors may be mentioned. The progress in this line may be summed up in the statement that the light and possibly complicated engine of the pleasure car has been divorced from the commercial vehicle. The tendency toward simplification everywhere manifested is here shown in the elimination of the ultra-lightweight metals of high first cost in favor of better known and more stable materials of a low price per pound; in a word, the substitution of cast iron for aluminum. In addition, there is the relative increase in stroke with a corresponding decrease in speed, which may be summed up as the substitution of the long stroke slow-speed motor of long life for the "short" high-speed engine of comparatively short existence. This example brings out a point which stands out clearly in the whole list of commercial improvements, and that is, the decrease in repairs or maintenance, due to the additional skill in designing and superior choice of materials.

This being an item which either encourages or discourages the new convert to the power wagon is of vast importance and far-reaching in its results. Therefore, it is well worthy of careful attention. A specific instance of this under another sub-division is the matter of tires. This has been given most careful attention, both by the tire and the car manufacturers, and well it might, for of all the items which have demanded attention in the past, that of tires has up to very recently received the least. This lack of attention has manifested itself in the use of the tire which cost the least, regardless of the prospective service. It has cropped out in such shapes as the use of one-and-a-half ton tires on three-ton trucks. Naturally this spelled quick tire depreciation, each hardly-won convert soon slipped back to horses, and the truck became known as a "tire eater." It is pleasing to note in this connection the increased attention now being given to this subject by both sides.

The first wheels were merely larger pleasure car wheels with no visible difference. To-day we find the two as different as black and white. The truck wheels are now very properly built for truck use with heavier, more rugged, and long-lived parts correctly proportioned to the work, and account taken of the inevitable and ill-advised overload. The weakest portion of the wood wheel is the junction of the spoke and the felloe, or rather at the reduced diameter of the spoke where it enters the felloe. A recent movement among the English heavy vehicle manufacturers has as its object the elimination of this weak point. This is accomplished by the gradual widening out of the spoke from hub to felloe and the change from a round to a square end, with a vastly increased area at the breaking point. In this connection, all steel wheels are receiving much attention for important work, and those in use have given satisfaction.

The matter of noise is one that is becoming of larger importance every day, as users of good vehicles find that noise is separable from the proper operation of cars; in other words, as they find out that it is possible to have a noiseless vehicle operate as well as a noisy one. This was for a long time considered as an exclusive feature of the electric, but that idea is losing ground daily. The change has been brought about by the successful use of chain cases, silent chains, and of the worm gear





drive. A similar desired result has been the reason for the use of the planetary transmission on small cars and of the individual clutch type on larger cars.

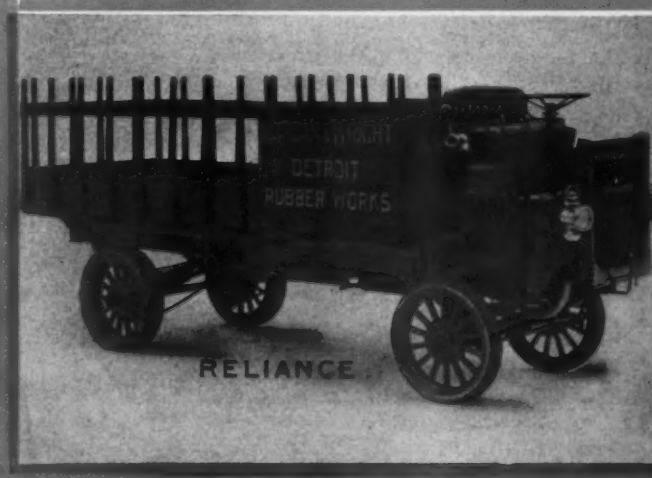
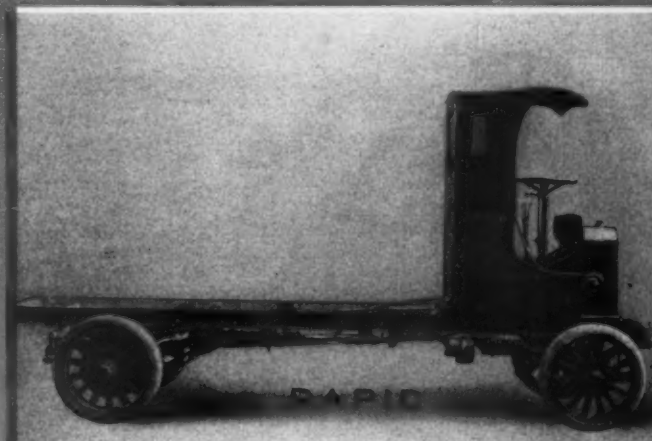
Simplification and increased strength is everywhere noticeable with a distinct absence of that feature of some pleasure cars known as "over-designing." The tendency is to make one simple part do the work of two complicated ones, if possible. Such outcroppings of this as the absence of spark advance have made possible the use of men of more limited intelligence and consequently lower price as drivers. This was a point formerly overlooked, but is now given its proper share of attention, so that one would be safe in saying of some truck, "that vehicle was designed to be driven by a \$12-a-week horse driver." This statement upon analysis is seen to include the points previously dwelt upon, viz., simplification, elimination, strength, and stability. These four words spell progress when applied to the commercial vehicle industry.

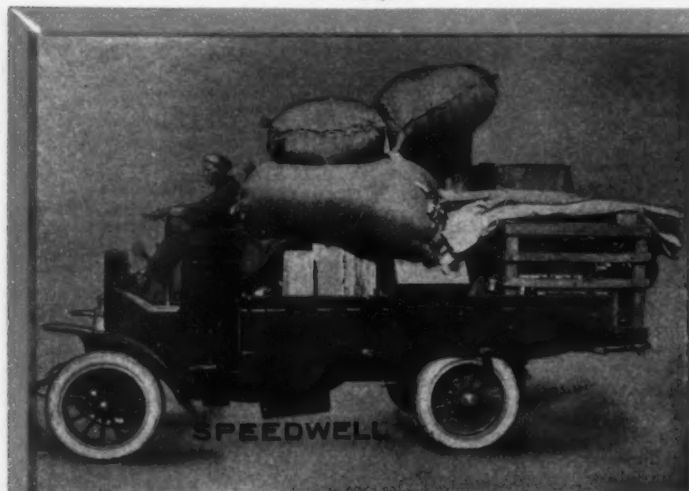
American Truck.—The American Motor Truck Company, Lockport, N. Y., covers the field completely with seven regular models, ranging from a 20-horsepower one-half ton commercial known as Model T, to Model O, which is rated at five tons, and is equipped with a 65-horsepower motor. Three of the line use a two-speed transmission, and with ample power through the good offices of a four-cylinder motor, it is not to be wondered at if the system is regarded as an unqualified success. The models with motors rated below 40 horsepower are equipped with three-speed transmissions, and it will be understood that a reverse is included in every case. In sight-seeing work, the American is very well known, and the same company is making inroads in "stage" service. It is to be noted that in general trucking and delivery service the American products are most in use.

Brush.—This maker will concentrate his energy and factory capacity upon one type and model of light delivery wagon. That single product of the Brush Runabout Company, of Detroit, Mich., probably possesses more original features than any other car of a similar type upon the American market. Beginning with left-hand control, coil springs, wood axles, single-cylinder vertical motor, etc., right through the car, this originality crops out and makes this what the maker desired it to be, a decidedly different vehicle. No doubt, when the buying public has been educated to see the advantages of these "decidedly different" features, we may expect that they will sell in very large numbers, as Brush has selected the largest field of all, the small dealer or trader who handles very light weights. This little car weighs but 950 pounds and is built to carry 500 pounds normally and 300 pounds overload, making a maximum weight, when fully loaded, of 1750 pounds. The single cylinder 7-horsepower motor will, then, never have over 250 pounds per horsepower, so that the power provided is ample. In addition, these cars are geared down very low, so low, in fact, that a speed in excess of 14 to 15 miles per hour is impossible.

Cleveland Autocab.—The idea of the Cleveland Autocab Company, Geneva, O., is to place at the disposal of users a reliable "taxicab" quite up to the requirements in view of the arduousness of the service, and to leave out every possible complication. The four-cylinder motor, of a well-designed type, has cylinders 3-7-8 x 4 inches, bore and stroke, respectively, and a multiple disc clutch transmits the power to a three-speed gear-set. In all the details, from the taxicab point of view, the product of the company is well worth the serious attention of users of cars of the class, and it is pleasant to note that the trade in this line is so brisk as to vie with the other branches of the automobile trade.

De Dion.—This old and favorably known company has from the first recognized the value of taxicabs and the examples of this make are conspicuous factors in this class of work. Among the "foreign contingent" the De Dion is regarded most favorably, not only because of the nice appearance the cars make, but in view of the reliability that has always been a feature of the products of the company. The American end of the business is handled by the De Dion Bouton Selling Branch, 32 Cedar street, New York City.





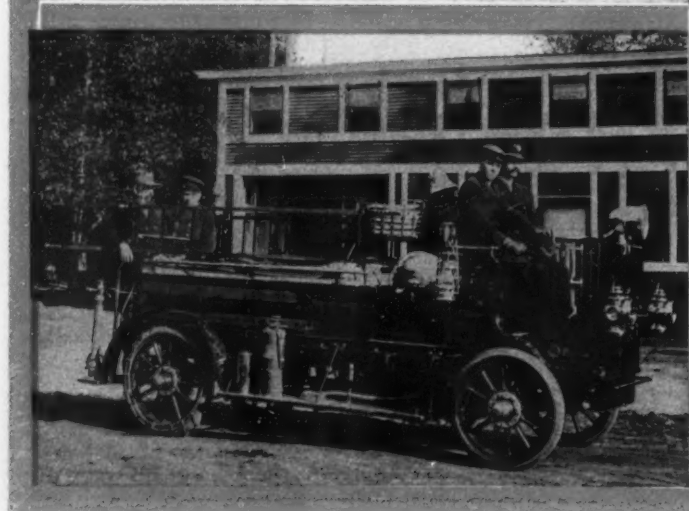
SPEEDWELL



MANHATTAN



AMERICAN



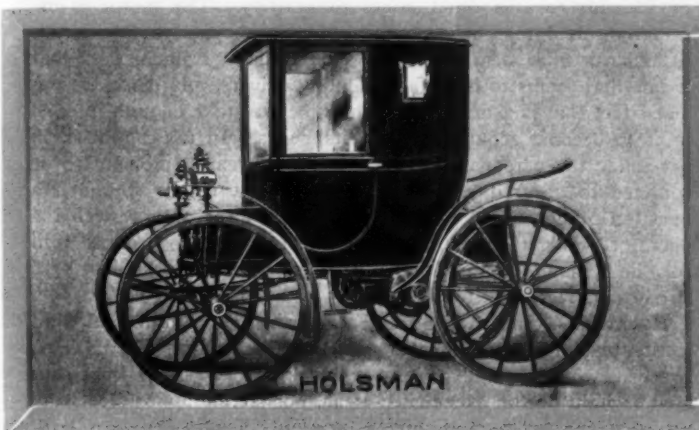
Gramm-Logan.—From a delivery wagon to a 3-ton truck, ranging in price from \$1,600 to \$3,500, the situation from the commercial point of view is in a very healthy state. The three models are each with four-cylinder motors, and all but the delivery wagon have transmissions with three speeds and reverse. The delivery wagon and the 1 1/2-ton truck are provided with a 25-horsepower motor, while the three-ton truck is equipped with a 45-horsepower motor. This product of the Gramm-Logan Company, of Bowling Green, O., has by its conservative practice and the excellence of its product made itself known for its good work in every industrial center. For additional information, the general table of cars may be consulted. In the meantime it may not be out of place to point out that this company has gone into the question of the body work in commercial service, and it is to its efforts largely that the commercial automobile has jumped to great popularity. It is all very well to have a fine chassis, but when all is said, it is important to have a stable and commodious platform on which to rest the goods to be transported.

Hart-Kraft.—For commercial work the product of the Hart-Kraft Motor Company, York, Pa., has a wide range of uses and is becoming very popular, indeed. The model A-O chassis is available for any purpose that occasion may demand, while models A-1, A-2 and A-3 are used for delivery wagons. The data of these delivery propositions will be found in the general tables, and it will be the idea to limit discussion here to a résumé of the top facts. The motor is the same for all of the models, rated at 14 horsepower, is of the two-cylinder type, and is provided with a two-speed transmission. This company has the right idea when it comes to light delivery work in which time is a large factor. The Hart-Kraft delivery wagon has a wide radius of action and speed in the process. Stores do not have to deliver heavy burdens so much as they do innumerable packages, which are wanted the day they are ordered.

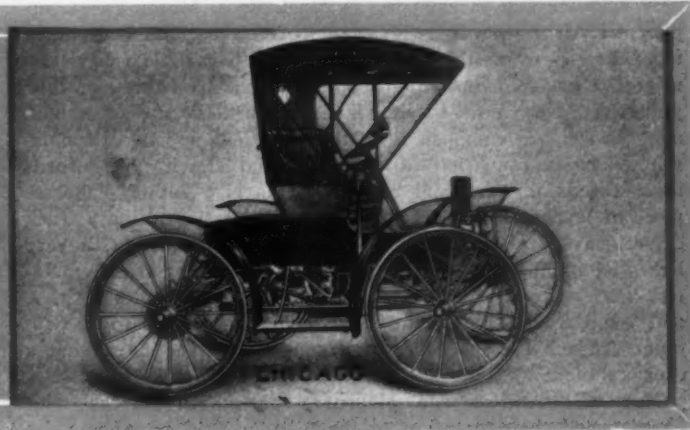
Holsman.—The delivery wagon is an outgrowth of the high-wheeled or buggy type of car produced by this maker, the Holsman Automobile Company, of Chicago, Ill. This wagon has the large 42-inch and 48-inch wheels, made popular by the motor buggy, these being equipped with 1 1/8-inch solid tires. While other makers wondered if the steel cable drive was all right, this manufacturer with accurate foresight proceeded to use it and proved its quality in actual service. The two-cylinder horizontal opposed air-cooled motor and tubular steel frame so lend themselves to light weight that the vehicle ready for service weighs only 930 pounds. With a load of equal weight the ratio of total weight to power will attain the very low figure of 145 pounds per horsepower, as the 4 x 4 two-cylinder motor, while rated at 12.8 (upon which basis the above ratio was figured), will develop quite a little power over and above this rating. In the hands of the ignorant horse driver, usually employed on delivery wagons, this simple machine, with the absence of the water circulation, and consequent simplification, should do very well.

Gaeth.—Ever since Paul Gaeth has been devoting his attention to the manufacture of automobiles, both before and since the formation of the Gaeth Automobile Company, of Cleveland, he has given a great deal of time to perfecting a single-cylinder type of car for commercial purposes, this now being listed as Gaeth Type K, for the coming season. Its power-plant consists of a single-cylinder horizontal motor rated at 12-15 horsepower, while the change-speed gear is of the planetary type, giving two speeds forward, the power reaching the rear wheels through double side chains, thus making the car as a whole as simple as it is possible to design it, so that it can be depended upon to render constant and efficient service in the hands of the most inexperienced driver. The Gaeth Type K delivery wagon has a load capacity of 2,000 pounds and is very economical to run and maintain.

Grabowsky.—One of the biggest, if not the biggest, item in holding back the progress of commercial wagons has been the troubles due to improper maintenance, many a man who looked after his horses and wagons properly failing to give the power wagon a thought, with natural results. This has now been obviated by the Grabowsky Power Wagon Company, of



HOLSMAN



CHICAGO

Detroit, Mich., who sell all of their nine commercial vehicles upon a maintenance basis. This scheme includes the entire maintenance, care, repair, washing, cleaning, etc., necessary to keep the vehicle running all day and every day. With this in view, the Grabowsky Company is establishing maintenance garages in the larger cities where they propose to sell their cars. The full line to date includes delivery wagons, one and two-ton trucks, ambulances, police patrols, fire wagons, seven, ten, and

the roller type, etc., which have been successfully used on these well-known motor buggies, have also been applied to the two types of commercial wagons. The power equipment of the two is ample for any service it may go up against, the mail wagon having a motor conservatively rated at 13-horsepower, while the motor on the delivery car will easily develop more than the 16-horsepower claimed for it.

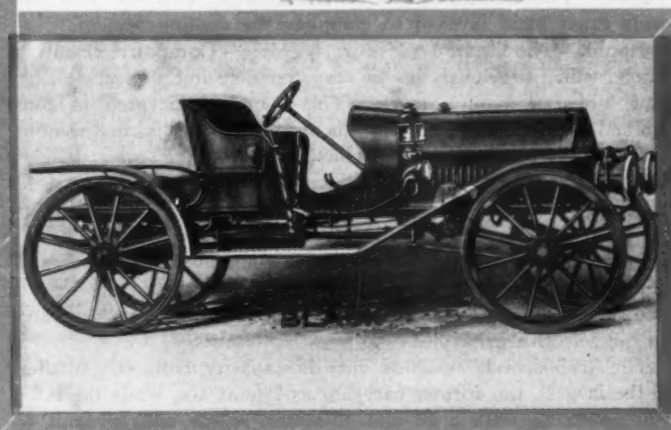
Lansden.—The name of Lansden has been chiefly associated with commercial types of electric vehicles employing the Edison alkaline storage battery as the source of current, though pleasure vehicles have been made by this firm from time to time. In its business of turning out commercial vehicles, the Lansden Company, Newark, N. J., has naturally devoted its attention to a range of types as extended as the wants of its



KIBLINGER

twelve-passenger buses, and sight-seeing cars. All these are equipped with the Grabowsky type of quickly demountable power plant, consisting of two cylinder opposed engine, two-speed planetary transmission, water-cooling, and ignition systems grouped at the front end upon a sub-frame, the whole being removable it is claimed in about three hours.

Kiblinger.—The delivery and mail wagons by this motor buggy concern, the W. H. McIntire Company, of Auburn, Ind., while possessing all of the other motor buggy characteristics, do not have the wheels of large diameter peculiar to this type. Instead, the wagons are equipped with small 34-inch wheels, which, however, have buggy tires 1 1-8 and 1 1-4 in size. The other features, such as angle iron frame, horizontal opposed air-cooled motor, planetary transmission, double chain drive of



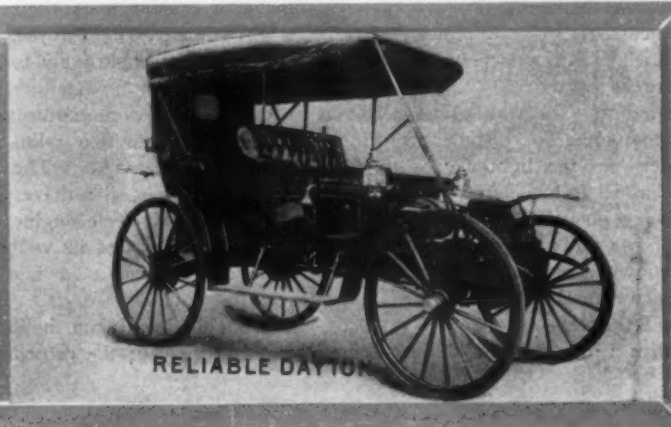
LANSDEN

numerous customers. For the 1909 season, there will be added an electric brougham and a taxicab type of attractive lines, the latter naturally being available also for private use as a town car. The numerous features of design and construction that have combined to make for successful service and low cost of maintenance in the Lansden commercial cars will be embodied in these two new cars.

Manhattan.—Among the pioneers in the power wagon busi-



HART-KRAFT



RELIABLE DAYTON



ness who are still in existence is Mack Bros. Motor Car Company, of Allentown, Pa. The name of this car has been taken from the city which this maker claims as his particular field and where he has sold most of his output in the past three or four years; viz., New York City. All cars, regardless of size, weight, and service, are equipped with the same engine and transmission. The transmission of the individual clutch type affords three speeds forward and reverse. This is a rather elaborate piece of mechanism to put into the hands of the ordinary truck driver, having no less than ten imported ball bearings, a very light aluminum case, delicate gear shifting forks, of friable material, and other similar points. The full line includes 2, 3, 4, and 5 ton trucks, buses, and sight-seeing cars of 12 to 22 passenger capacity, a special car now under construction having a capacity of 28.

Maxwell.—Among the pleasure car manufacturers who have turned their attention to the broader field of commercial cars is the Maxwell-Briscoe Motor Company, of Tarrytown, N. Y. But one model has been produced thus far, this being a light delivery wagon of about 1,000 pounds carrying capacity. This has all of the characteristic Maxwell features and is one of the very few commercial cars to be equipped with pressed steel frame, multiple disc clutch, and sliding gear transmission. The wheels are small with 30 by 3 1-2 solid tires on the front and 30 by 4 on the rear. A wheelbase of 90 inches allows turning in a very short space and easy manipulation in crowded streets, both very good features on a commercial delivery wagon. The weight of 1,700 pounds is well proportioned to the power, which latter is produced by a 5 by 5 two-cylinder opposed motor, cooled by the thermo-siphon circulation of water. This 20-horsepower will give 85 pounds per horsepower light and 135 pounds loaded. The well-known Maxwell radiator with the four-inch wide brass band is used to complete the cooling system.

Rapid.—The Rapid Motor Vehicle Company, Pontiac, Mich., which previously had a very complete line of vehicles, has now added a five-ton truck. This company, devoted to commercial cars exclusively, is producing police patrols, fire wagons, ambulances, opera and other buses, sight-seeing cars, delivery wagons, and trucks. With the exception of the latest arrival, all of these successful vehicles have a two-cylinder motor of the opposed type, size 5 1-4 by 5, rated at 24-horsepower. The big baby of the lot, however, has a four-cylinder vertical power producer, with cylinders 5 1-2 by 6 1-2. While the others have a two-speed planetary, this has a three-speed sliding gear, operated on the selective principle.

The "rubberneck" wagons vary in capacity from the smallest to the largest, the former carrying as low as six, while the latter run up to 22, with a 28 and 30-seater, which will be built on special order. The wide range of this company's line of cars in itself predicts a very wide field of usefulness and a consequently large and widely distributed product. It is, therefore, not surprising that each succeeding year sees a large addition to the factory, made necessary even in years like the past, when not a few makers were obliged to try hard to land any kind of an order, no matter how small.

Reliance Trucks.—The line of heavy trucks formerly manufactured in Detroit, Mich., by the Reliance Motor Car Company, which also built pleasure cars, is now being continued by their successors, the Reliance Motor Truck Company, of Owosso, Mich. The new company will devote themselves exclusively to trucks in the 2, 3, 4, and 5-ton sizes, and 12 to 26-passenger wagons. The whole line will be equipped with two-cycle motors, the number of cylinders varying with the load from two cylinders on the lighter cars to four on the very heaviest. The chassis follows standard truck practice; otherwise, the driver being placed over the motor. The use of the two-cycle engine allows the employment of cheaper drivers, on account of its well known simplicity. This feature is one that has been a big factor in the large sales of these trucks.

Renault.—Among the taxicabs the Renault has taken hold with a grip that might have been foreseen in view of the record

of Renault cars in other zones of activity. The motor is especially suited to cab work because it is short, and the chassis of the cab must also be short. The Renault transmission gear is one that seems to hold favor among drivers, and it is a recognized fact that if a man likes a thing he will take enough interest in it to become acquainted with its needs. In taxicab work in particular the personal equation is of the greatest moment to be confined to assured control. In a word, it is not so much a question of how good a cab is as it is a matter of how well the operator will get on with it. The future seems to promise well for the Renault Frères Selling Agency, which is located at 1776 Broadway, New York City.

Rockwell.—One of the newcomers in the commercial field is the Bristol Engineering Corporation, of Bristol, Conn. This concern, which is well and favorably known in other lines, has now brought out an excellent taxicab, not merely a side step from pleasure car production, but a new and original design with many commendable features. The list of parts would show only a standard car of small dimensions with four cylinder motor under the hood, selective three-speed transmission shaft drive, etc., but to delve below the surface would be to find that the parts are standard in name only, the details showing a remarkable quality of up-to-dateness. But one model is produced with 3 5-8 by 4 1-8 motor, rated at 20-horsepower, equipped with landaulet body, and furnished with any make of taximeter.

Sultan.—This "town-car" proposition at \$3,000, with a body that seats six, is fitted with a 10-12-horsepower motor and a three-speed transmission, more complete data of which will be found in the general table. The Sultan Motor Company, of Springfield, Mass., proposes to set the pace when it comes to service such as this, and the model above referred to promises to become one of the most popular of the day.

MICHIGAN CLUB WANTS A HOUSE.

GRAND RAPIDS, MICH., Dec. 21.—The Grand Rapids Automobile Club has found that its prospects for a new club house for the next season are very bright. Four plans are now offered, one to buy or lease the club house at Cascade used by the club in 1907, which is favored on account of the pleasant eight-mile drive. Another is the use of the Highland Golf Club house jointly with the golf club. The other plans are to have a club house erected on Grand River, about nine miles west of the city, in the midst of the fruit belt, or the party negotiating with the club offers to put it anywhere the club may desire.

The committee chairmen chosen by the newly elected president, J. R. Jackson, for the following year are: Club house, Dr. D. Emmett Welsh; law and ordinance, Charles B. Judd; auditing, M. D. Elgin; membership, Frederick Z. Pantlind; good roads, A. S. Rathbun; tours and contests, W. D. Vandecar.

CLUB NEWS IN GENERAL.

Elmira, N. Y.—At a recent meeting of the board of directors of the Elmira Automobile Club a resolution was passed renewing membership in the New York State Automobile Association which carries with it membership in the A. A. A., which latter body was endorsed. About 20 new members were elected, and the new president, Clay W. Holmes, appointed the membership, finance, good roads, laws and ordinances and entertainment committees.

Milbank, S. D.—The Milbank Motor Club has been formed with the following officers: President, J. W. Ross; vice-president, G. L. Wood; secretary, P. C. Saunders; treasurer, G. C. Middlebrook. The club will make road improvement its principal object, the roads in Grand County coming first on the list.

Oklahoma, Okla.—The Oklahoma City Automobile Association has pledged \$10,000 for the construction of a 25-mile speedway around the city.

Staten Island, N. Y.—The Richmond County Automobile Club is planning a new club house, to be finished next spring, at Grant City.



ACCESSORIES REPRESENT A VAST BUSINESS

If the show is rich in automobiles, both commercial and for pleasure, it is equally profuse in its representation of the great industries that have grown up around it as a boon companion. The accessories on exhibition are of every kind and description, from tires to tops, for the cars, and gauntlets to gowns for the patrons. They represent all the devices for ignition purposes, as magnetos, timers, coils, batteries, wire and the incidentals that space forbids mentioning.

A little further along and the question of lubrication is dealt with, from the finest of mineral oils to the hardest grease, varying the monotony by illustrations of the application of graphite. If the lubricants are in plenty, it is not to overlook the many devices for their efficient use.

From the lubricants to fuel and the means, is but a step.

Of carbureters there are the best examples of the industry, side by side, with choice as impossible as the selection of the superior of peas in a pod. As well as carbureters, there are tanks, piping, fittings, pressure-regulators, pumps, and last, but not least, all devices for safe and efficient storage of gasoline.

Lighting equipment is so profusely and so well represented that any attempt to discuss the matter is almost futile. Acetylene is favored largely; of generators there are many fine examples, and the storage tanks are there as well. Lamps are bigger, better, and with all the old strictures, as a memory, at rest in the grave of forgetfulness. Oil lamps are in fine style, as emergency necessities and for "town service." Electric lighting is in vogue, and the means are at hand. This is of more than passing interest, since autoists are rather fond of electric lights, having used them on electric vehicles. Tools—they are all there.

The tire problem of to-day as it is portrayed at the show, is the problem of selection. In this line competition is so acute that there are no bad tires, and there are no cars using tires so small for the work that they will not well serve the purpose. That there are selections, depending upon the service to be rendered, it is true, but the question is one to be disposed of by the users of cars, aided by the intelligent staff the tire makers have assembled around them. Pneumatics hold the center of the stage when it comes to pleasure cars, and in commercial work it is the "solids" that are used, unless in a couple of isolated cases. The high-wheelers also use solids, and in such cases they are of small section, because the wheels afford much of the qualities that more properly reside in pneumatic tires.

Shoes are made in diverse ways, plain, non-skid, thick and thin. Tubes are far more stable than they once were. Valves and other fittings are secure, and "dismountable" rims are much in evidence. Spare wheels and extra rims are exploited, all with the idea of rendering touring more pleasant than it otherwise would be.

Tire inflating devices take on several forms, from tanks to power pumps, and it is now a very simple matter to inflate an unruly tire without soiling the hands or pumping until the complexion changes. It is now possible to issue rules telling how much pressure should reside in the tires, with the expectation that the rules will be followed. In the old days, the idea of pumping up a 36 by 5-inch tire to 100 pounds per square inch, with a bicycle pump, was as a mere joke. The hand pumps now to be had, of which excellent examples are to be seen at the show, certainly do approach near to perfection. Besides tires, pumps and suchlike, there are tire-chains, and non-skid covers in leather and other forms. Some of the covers are "studded."

Cape tops are so well represented as to make one wonder why, unless it is that these tops are of great utility. They come nearer rendering a touring car universal than any other plan possible to devise. A touring car fitted with a good cape-top, provided with curtains, fitted with a wind-shield, comes about as near being wind and weather-proof as anything can be; moreover, the cost is low, and the weight is not enough to take notice of, unless to note that it is far less than the weight of any other device that does the same work. A touring car, fitted with a good cape top, is quite as capable of protecting the occupants of the car, as the protection afforded by a limousine, at a far lower cost, and without the discomfort of being housed in on a fine day, when half the pleasure of touring would be lost were one to take the highway in a limousine. Even the runabout types are in vogue with tops, and they are rendered of double value thereby. Just as useful are the robes and all sorts of costumes, the use of which will require no time to describe. That the autoist is being looked after, however, is assured.

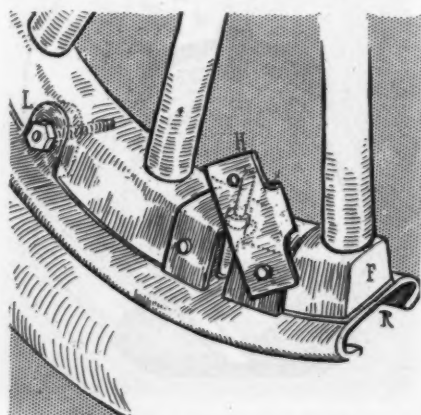
What follows is an incomplete summing up of the accessories division, taking the material which was most convenient and nearest at hand, but the subject will receive more thorough attention in the issue of a week hence. Therefore, those who search unsuccessfully may reasonably expect that attention will be called to their products in THE AUTOMOBILE of January 7.

Demountable Rims and Tire Features.—This year will see a landslide to demountable rims, and it is safe to predict that within the coming 12 months many

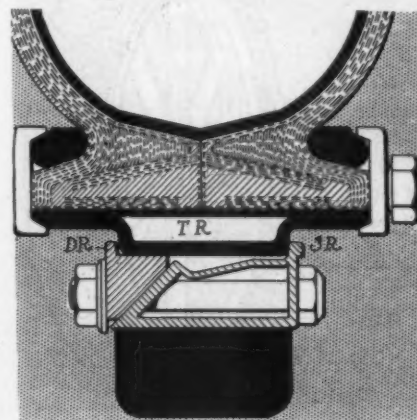
new concerns will spring up manufacturing these great time economizers and labor savers of road work.

The improved Diamond demountable rim consists of a rim *R* carrying the tire and which attaches to the felloe *F* by means of several lugs *L* on the rim, which sit in recesses in the side of the felloe, and the rim is anchored on by cross bolts through the felloe and lugs *L* so that removing the nuts on these bolts allows of pulling the rim and tire off at that side. An improvement in the rim is the discontinuance of the blind valve and cutting a slot in the side of the felloe for the valve stem. Where this is cut a supporting brace *H* is used to strengthen the felloe and is held in place by a couple of through bolts. In removing this rim the brace must be removed before the rim can be taken off. There are five lugs *L* on each rim, so that seven nuts have to be taken off in removing the rim.

The Fisk demountable rim, carrying the mechanically fastened Fisk clincher tire, consists of the tire rim *TR*, which, at the right side, rests on the stationary rim *SR*



Diamond Demountable Rim.



New Rim, Fisk Rubber Co.



ness who are still in existence is Mack Bros. Motor Car Company, of Allentown, Pa. The name of this car has been taken from the city which this maker claims as his particular field and where he has sold most of his output in the past three or four years; viz., New York City. All cars, regardless of size, weight, and service, are equipped with the same engine and transmission. The transmission of the individual clutch type affords three speeds forward and reverse. This is a rather elaborate piece of mechanism to put into the hands of the ordinary truck driver, having no less than ten imported ball bearings, a very light aluminum case, delicate gear shifting forks of friable material, and other similar points. The full line includes 2, 3, 4, and 5 ton trucks, buses, and sight-seeing cars of 12 to 22 passenger capacity, a special car now under construction having a capacity of 28.

Maxwell.—Among the pleasure car manufacturers who have turned their attention to the broader field of commercial cars is the Maxwell-Briscoe Motor Company, of Tarrytown, N. Y. But one model has been produced thus far, this being a light delivery wagon of about 1,000 pounds carrying capacity. This has all of the characteristic Maxwell features and is one of the very few commercial cars to be equipped with pressed steel frame, multiple disc clutch, and sliding gear transmission. The wheels are small with 30 by 3 1-2 solid tires on the front and 30 by 4 on the rear. A wheelbase of 90 inches allows turning in a very short space and easy manipulation in crowded streets, both very good features on a commercial delivery wagon. The weight of 1,700 pounds is well proportioned to the power, which latter is produced by a 5 by 5 two-cylinder opposed motor, cooled by the thermo-siphon circulation of water. This 20-horsepower will give 85 pounds per horsepower light and 135 pounds loaded. The well-known Maxwell radiator with the four-inch wide brass band is used to complete the cooling system.

Rapid.—The Rapid Motor Vehicle Company, Pontiac, Mich., which previously had a very complete line of vehicles, has now added a five-ton truck. This company, devoted to commercial cars exclusively, is producing police patrols, fire wagons, ambulances, opera and other buses, sight-seeing cars, delivery wagons, and trucks. With the exception of the latest arrival, all of these successful vehicles have a two-cylinder motor of the opposed type, size 5 1-4 by 5, rated at 24-horsepower. The big baby of the lot, however, has a four-cylinder vertical power producer, with cylinders 5 1-2 by 6 1-2. While the others have a two-speed planetary, this has a three-speed sliding gear, operated on the selective principle.

The "rubberneck" wagons vary in capacity from the smallest to the largest, the former carrying as low as six, while the latter run up to 22, with a 28 and 30-seater, which will be built on special order. The wide range of this company's line of cars in itself predicts a very wide field of usefulness and a consequently large and widely distributed product. It is, therefore, not surprising that each succeeding year sees a large addition to the factory, made necessary even in years like the past, when not a few makers were obliged to try hard to land any kind of an order, no matter how small.

Reliance Trucks.—The line of heavy trucks formerly manufactured in Detroit, Mich., by the Reliance Motor Car Company, which also built pleasure cars, is now being continued by their successors, the Reliance Motor Truck Company, of Owosso, Mich. The new company will devote themselves exclusively to trucks in the 2, 3, 4, and 5-ton sizes, and 12 to 26-passenger wagons. The whole line will be equipped with two-cycle motors, the number of cylinders varying with the load from two cylinders on the lighter cars to four on the very heaviest. The chassis follows standard truck practice; otherwise, the driver being placed over the motor. The use of the two-cycle engine allows the employment of cheaper drivers, on account of its well known simplicity. This feature is one that has been a big factor in the large sales of these trucks.

Renault.—Among the taxicabs the Renault has taken hold with a grip that might have been foreseen in view of the record

of Renault cars in other zones of activity. The motor is especially suited to cab work because it is short, and the chassis of the cab must also be short. The Renault transmission gear is one that seems to hold favor among drivers, and it is a recognized fact that if a man likes a thing he will take enough interest in it to become acquainted with its needs. In taxicab work in particular the personal equation is of the greatest moment to be confined to assured control. In a word, it is not so much a question of how good a cab is as it is a matter of how well the operator will get on with it. The future seems to promise well for the Renault Frères Selling Agency, which is located at 1776 Broadway, New York City.

Rockwell.—One of the newcomers in the commercial field is the Bristol Engineering Corporation, of Bristol, Conn. This concern, which is well and favorably known in other lines, has now brought out an excellent taxicab, not merely a side step from pleasure car production, but a new and original design with many commendable features. The list of parts would show only a standard car of small dimensions with four cylinder motor under the hood, selective three-speed transmission shaft drive, etc., but to delve below the surface would be to find that the parts are standard in name only, the details showing a remarkable quality of up-to-dateness. But one model is produced with 3 5-8 by 4 1-8 motor, rated at 20-horsepower, equipped with landaulet body, and furnished with any make of taximeter.

Sultan.—This "town-car" proposition at \$3,000, with a body that seats six, is fitted with a 10-12-horsepower motor and a three-speed transmission, more complete data of which will be found in the general table. The Sultan Motor Company, of Springfield, Mass., proposes to set the pace when it comes to service such as this, and the model above referred to promises to become one of the most popular of the day.

MICHIGAN CLUB WANTS A HOUSE.

GRAND RAPIDS, MICH., Dec. 21.—The Grand Rapids Automobile Club has found that its prospects for a new club house for the next season are very bright. Four plans are now offered, one to buy or lease the club house at Cascade used by the club in 1907, which is favored on account of the pleasant eight-mile drive. Another is the use of the Highland Golf Club house jointly with the golf club. The other plans are to have a club house erected on Grand River, about nine miles west of the city, in the midst of the fruit belt, or the party negotiating with the club offers to put it anywhere the club may desire.

The committee chairmen chosen by the newly elected president, J. R. Jackson, for the following year are: Club house, Dr. D. Emmett Welsh; law and ordinance, Charles B. Judd; auditing, M. D. Elgin; membership, Frederick Z. Pantlind; good roads, A. S. Rathbun; tours and contests, W. D. Vandecar.

CLUB NEWS IN GENERAL.

Elmira, N. Y.—At a recent meeting of the board of directors of the Elmira Automobile Club a resolution was passed renewing membership in the New York State Automobile Association which carries with it membership in the A. A. A., which latter body was endorsed. About 20 new members were elected, and the new president, Clay W. Holmes, appointed the membership, finance, good roads, laws and ordinances and entertainment committees.

Milbank, S. D.—The Milbank Motor Club has been formed with the following officers: President, J. W. Ross; vice-president, G. L. Wood; secretary, P. C. Saunders; treasurer, G. C. Middlebrook. The club will make road improvement its principal object, the roads in Grand County coming first on the list.

Oklahoma, Okla.—The Oklahoma City Automobile Association has pledged \$10,000 for the construction of a 25-mile speedway around the city.

Staten Island, N. Y.—The Richmond County Automobile Club is planning a new club house, to be finished next spring, at Grant City.



ACCESSORIES REPRESENT A VAST BUSINESS

If the show is rich in automobiles, both commercial and for pleasure, it is equally profuse in its representation of the great industries that have grown up around it as a boon companion. The accessories on exhibition are of every kind and description, from tires to tops, for the cars, and gauntlets to gowns for the patrons. They represent all the devices for ignition purposes, as magnetos, timers, coils, batteries, wire and the incidentals that space forbids mentioning.

A little further along and the question of lubrication is dealt with, from the finest of mineral oils to the hardest grease, varying the monotony by illustrations of the application of graphite. If the lubricants are in plenty, it is not to overlook the many devices for their efficient use.

From the lubricants to fuel and the means, is but a step.

Of carbureters there are the best examples of the industry, side by side, with choice as impossible as the selection of the superior of peas in a pod. As well as carbureters, there are tanks, piping, fittings, pressure-regulators, pumps, and last, but not least, all devices for safe and efficient storage of gasoline.

Lighting equipment is so profusely and so well represented that any attempt to discuss the matter is almost futile. Acetylene is favored largely; of generators there are many fine examples, and the storage tanks are there as well. Lamps are bigger, better, and with all the old strictures, as a memory, at rest in the grave of forgetfulness. Oil lamps are in fine style, as emergency necessities and for "town service." Electric lighting is in vogue, and the means are at hand. This is of more than passing interest, since autoists are rather fond of electric lights, having used them on electric vehicles. Tools—they are all there.

The tire problem of to-day as it is portrayed at the show, is the problem of selection. In this line competition is so acute that there are no bad tires, and there are no cars using tires so small for the work that they will not well serve the purpose. That there are selections, depending upon the service to be rendered, it is true, but the question is one to be disposed of by the users of cars, aided by the intelligent staff the tire makers have assembled around them. Pneumatics hold the center of the stage when it comes to pleasure cars, and in commercial work it is the "solids" that are used, unless in a couple of isolated cases. The high-wheelers also use solids, and in such cases they are of small section, because the wheels afford much of the qualities that more properly reside in pneumatic tires.

Shoes are made in diverse ways, plain, non-skid, thick and thin. Tubes are far more stable than they once were. Valves and other fittings are secure, and "dismountable" rims are much in evidence. Spare wheels and extra rims are exploited, all with the idea of rendering touring more pleasant than it otherwise would be.

Tire inflating devices take on several forms, from tanks to power pumps, and it is now a very simple matter to inflate an unruly tire without soiling the hands or pumping until the complexion changes. It is now possible to issue rules telling how much pressure should reside in the tires, with the expectation that the rules will be followed. In the old days, the idea of pumping up a 36 by 5-inch tire to 100 pounds per square inch, with a bicycle pump, was as a mere joke. The hand pumps now to be had, of which excellent examples are to be seen at the show, certainly do approach near to perfection. Besides tires, pumps and suchlike, there are tire-chains, and non-skid covers in leather and other forms. Some of the covers are "studded."

Cape tops are so well represented as to make one wonder why, unless it is that these tops are of great utility. They come nearer rendering a touring car universal than any other plan possible to devise. A touring car fitted with a good cape-top, provided with curtains, fitted with a wind-shield, comes about as near being wind and weather-proof as anything can be; moreover, the cost is low, and the weight is not enough to take notice of, unless to note that it is far less than the weight of any other device that does the same work. A touring car, fitted with a good cape top, is quite as capable of protecting the occupants of the car, as the protection afforded by a limousine, at a far lower cost, and without the discomfort of being housed in on a fine day, when half the pleasure of touring would be lost were one to take the highway in a limousine. Even the runabout types are in vogue with tops, and they are rendered of double value thereby. Just as useful are the robes and all sorts of costumes, the use of which will require no time to describe. That the autoist is being looked after, however, is assured.

What follows is an incomplete summing up of the accessories division, taking the material which was most convenient and nearest at hand, but the subject will receive more thorough attention in the issue of a week hence. Therefore, those who search unsuccessfully may reasonably expect that attention will be called to their products in *THE AUTOMOBILE* of January 7.

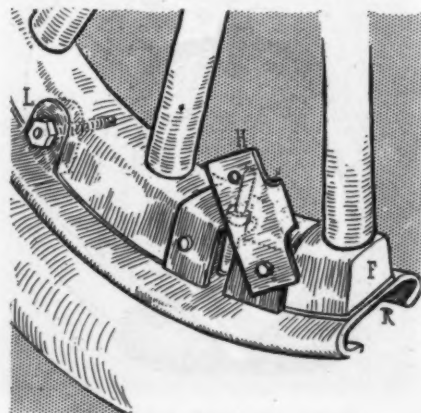
Demountable Rims and Tire Features.

—This year will see a landslide to demountable rims, and it is safe to predict that within the coming 12 months many

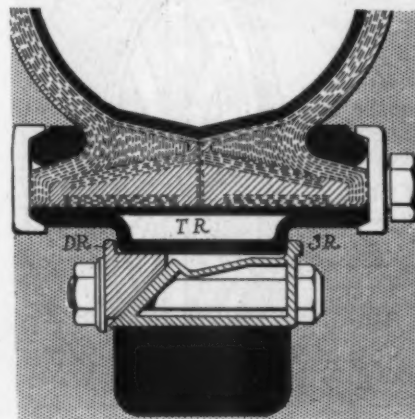
new concerns will spring up manufacturing these great time economizers and labor savers of road work.

The improved Diamond demountable rim consists of a rim *R* carrying the tire and which attaches to the felloe *F* by means of several lugs *L* on the rim, which sit in recesses in the side of the felloe, and the rim is anchored on by cross bolts through the felloe and lugs *L* so that removing the nuts on these bolts allows of pulling the rim and tire off at that side. An improvement in the rim is the discontinuance of the blind valve and cutting a slot in the side of the felloe for the valve stem. Where this is cut a supporting brace *H* is used to strengthen the felloe and is held in place by a couple of through bolts. In removing this rim the brace must be removed before the rim can be taken off. There are five lugs *L* on each rim, so that seven nuts have to be taken off in removing the rim.

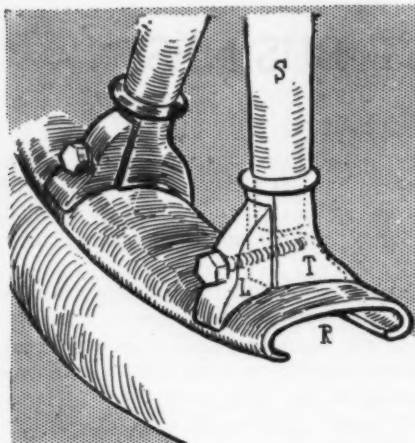
The Fisk demountable rim, carrying the mechanically fastened Fisk clincher tire, consists of the tire rim *TR*, which, at the right side, rests on the stationary rim *SR*



Diamond Demountable Rim.



New Rim, Fisk Rubber Co.



Healy Demountable Rim.

and at the other side on an expanding split V ring DR, which as the nuts holding it in place are tightened, the ring tends to climb the inclined surface of the stationary rim SR and so binds the tire rim TR on. In this rim it is necessary to remove the nuts holding the expanding ring DR in place when the ring drops out and the rim TR with tire can be pulled off. In putting the new rim on this process is reversed. Provisions are made to prevent creeping of the rim TR through the wheel felloe. As the nuts on these bolts are tightened, the wedges entering between the stationary and demountable rims on one side bind the demountable one in place while a low flange on the opposite side of the stationary prevents slipping off of the demountable on that side.

The Healy Leather Tire Company uses a demountable in which there is no wheel felloe, and when the rim with the tire is off the ends of the spokes are bare. Each spoke carries on its outer end a tenon T, which is a steel casting, into which the end of the spoke fits. The outer end of this is curved to correspond with the back of the clincher rim R. Secured to each tenon is anchored lock L held by a galvanized steel bolt with a bronze nut. By loosening

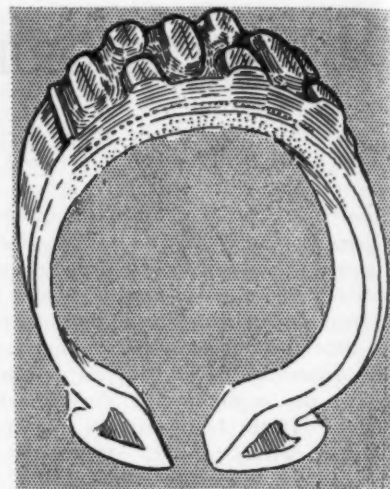
this bolt the locker L can be turned part around to allow the rim R to be pulled outward and off. In changing this rim there are as many nuts to loosen as the wheel has spokes.

A new demountable is the Sager, the product of the J. H. Sager Company, Rochester, N. Y. It is designed on the Fisk principle with a removable beveled ring at one side that forces the demountable rim against a beveled flange on the opposite side of the wheel felloe. The beveled ring is held in place by a series of cross-bolts in the felloe with hooked ends for resting against the beveled ring and nuts on the opposite ends. In removing this rim the nuts on the bolts are loosened so that the hooks may be turned toward the wheel hub, after which the beveled ring can be pulled off, followed by the tire. Each tire rim has riveted to its inner surface a metal strip with outwardly beveled edges, one of which bears against the beveled flange on the rim shrunk onto the felloe and the other against the anchoring ring.

A new idea is shown in Snell's resilient double-cushion tire, which is designed mainly to prevent skidding. A steel band 1-4 inch thick and 3 inches wide is bolted to the wooden felloe of the wheel. A 1-inch rubber cushion is mounted on this band and over this cushion are two other bands separated by about three-eighths of an inch. The rubber cushion is clamped between the upper and lower bands by bolts, which are free to slide through the lower band when the cushion is compressed. The cushioning effect is increased by the fact that there are in the rubber a number of holes which extend throughout its length. The non-skidding qualities are secured by means of ridges on the outer cushion of the rubber. These ridges, being V-shaped, which permits them to also serve as cleats and thus secure greater traction. As air can circulate between the ridges, it is claimed that this prevents raising as much dust as does an ordinary motor car wheel.

As a rival of demountable rims are the Stepney and Burrows spare rims. The Stepney consists of a clincher rim carrying an inflated tire which is attached to the clincher on the wheel rim by hooks which grip the wheel rim after the tire bead is thrust back. Several of these hooks are distributed regularly around the rim and each, when in position, is tightened, bringing the attached rim into rigid position. In addition to this, straps from the attached rims pass around spokes of the wheel, prevent any slipping of the Stepney. In the Burrows spare wheel the same method of attachment is used.

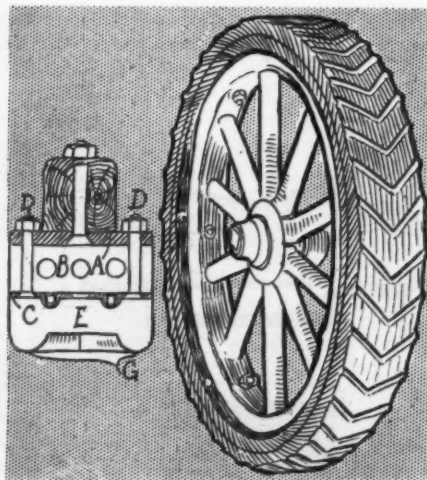
The Republic Rubber Company shows a rubber tread round skid. The Republic line for the coming season consists of regular clinchers and also tires of the split-bead made to fit the quick detachables. A rub-



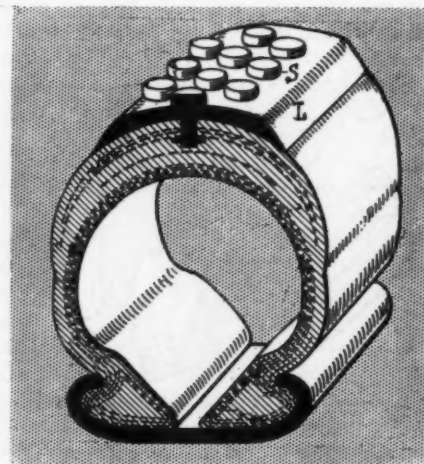
Republic Co. Staggered Tread.

ber tread non-skid tire is one of the features of the Republic Company's line. It is known as the Staggered tread tire, the projections on the tread being about 1-2 by 1 1-2 inches by about 3-16 inch high. They are a part of the main body of the tire and being thus incorporated, they help to eliminate the possibility of the tread loosening from the carcass of the tire.

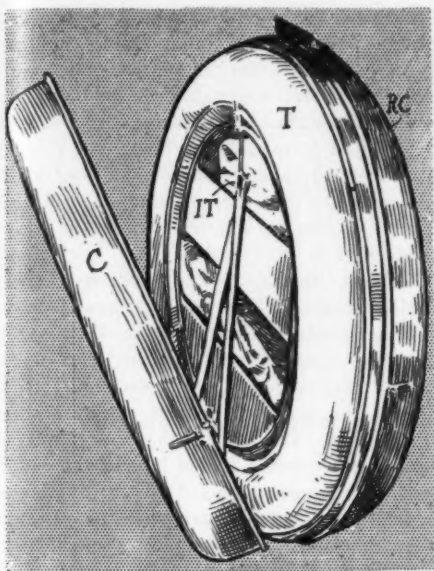
The construction of the Pennsylvania wrapped tread tire is practically unchanged over that of the past season except that a slight variation has been made in the composition used for the tread, which is designed to give longer life to the tire. The company shows a steel-studded non-skid type of tire, the durability of which is increased by the use of harder studs than it was formerly possible to obtain. These are case-hardened by a special process which hardens them practically to the center of the head. They are set in a strip of specially prepared leather on the tread L, which encircles the tire and holds them firmly against being pulled out or broken. The company also has a special tire of particularly high-grade manufacture, and in which there is considerable hand work. It has a white cover of extremely tough rub-



Snell's Solid Cushion Tire.



Pennsylvania Studded Tire.



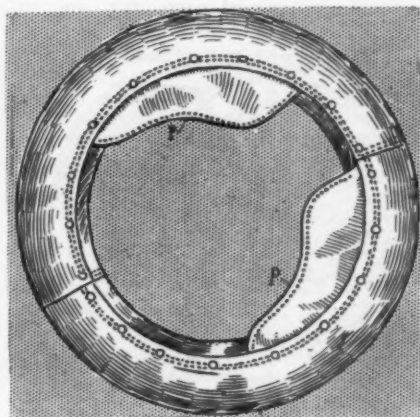
Merchant & Evans Tire Case.

ber and the fabric throughout is of Egyptian cotton with pure Para rubber friction.

The feature of the exhibit of the Merchant & Evans Company is new. As will be seen by the illustration, the metal casing is divided into two sections, *RC* being the rear part and *C* the cover. *T* is the outer casing, while *IT* shows the inner tubes snugly tucked away in the space inside the outer casing. The casing is fastened at the sides by catches and is locked at the top, which makes it proof against theft.

The Zeglen Bullet Proof Cloth Company has utilized its cloth in the construction of the pneumatic tire which is shown by this

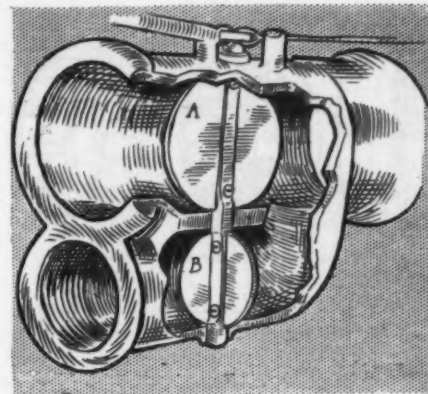
concern. The company has just started the manufacture of these pneumatics, and expects to have them on the market in another month. The inventor claims that he uses rubber only to secure resiliency and provide a good wearing surface. He uses his bullet-proof cloth for the fabric, the cloth being of silk and of eight strands in thickness. It is interwoven into one solid piece, and the claim is made that when it is vulcanized together with the outer rubber the fabric has more resiliency than the cotton and rubber combination. As an example of its puncture-proof features, the inventor cites an instance where a car fitted with these tires was driven seven times over a plank through which 28 sharp-pointed spikes had been driven. The test showed the outer rubber covering to have been badly lacerated by the spikes, but the inner tubing, composed of his cloth, was not penetrated, he claims.



Allen Specialty Co. Rim Case.

Transmission Parts.—The Merchant & Evans Company, Philadelphia, continues its rear axle with which is incorporated a three-speed gear-set with direct drive on both high and second speeds. In this axle there are two bevels on the differential constantly in mesh with two pinions on the gear-set mainshaft and between which pinions is a clutch for anchoring either pinion to the mainshaft. This company also has a rear axle gear-set in connection with a solid forged stationary axle, which is centrally dropped, forming a bed into which the housing for the gear-set and differential are anchored.

The Timken Roller Bearing Axle Company, Canton, O., is introducing its new back axle, which is of the floating construction and consists of a one-piece steel casing extending from one rear wheel to the other and with a central expansion for containing the differential. It is without truss rod. All adjustments for the bearings can be accomplished from the outside of the case. The steel casing gradually increases in strength toward the center and sudden variations in thickness are avoided. Internal and external brakes are fitted, the



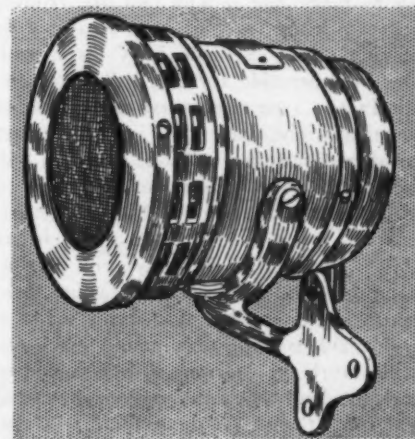
Showing Gabriel Horn Valves.

spring seatings are swivelled, and a swivelled V-torsion rod is used which spans the differential.

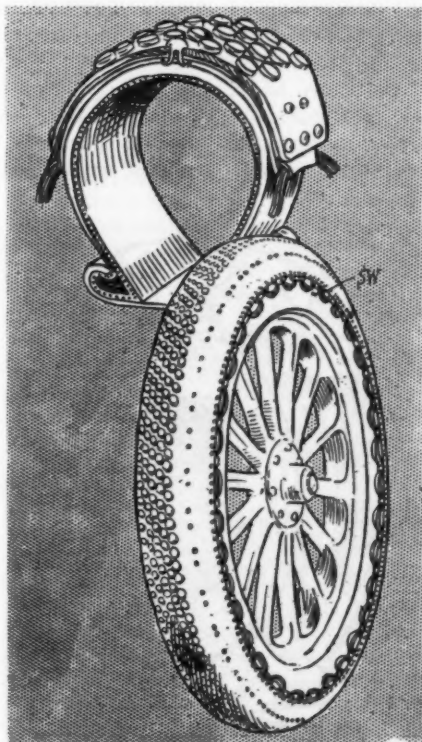
The Standard Roller Bearing Company, Philadelphia, continues its line of front and rear axles, the rear ones being of two types, one of the straight floating construction of the design used on Chalmers-Detroit cars and the other the combined rear axle and gear-set as used on Pennsylvania and Thomas cars.

Ideas in Horns.—Improvements over old models will be noted in the Gabriel Horn Manufacturing Company product, the feature of which the company is most proud being the valve that operates this exhaust horn. This valve is designed to prevent sticking, for as soon as the valve *A* in the main channel begins to close and the disk *B* in the branch channel, placed at an angle of 90 degrees, starts to open, it permits the exhaust immediately to escape, whereupon the horn responds and prevents the building up of back pressure. A cut-out is had by removing the circular disk *A* in the main channel, which gives an escape of 1 1/4 inches and relieves the back pressure caused by the muffler.

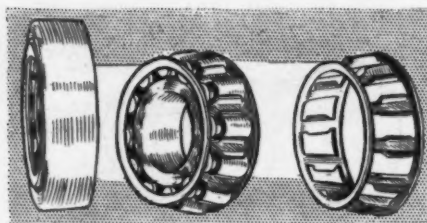
The Sireno, of the Sireno Company, is an electric siren with all rotating parts equipped with adjustable ball bearings. There is a field magnet cast of one piece of special metal, the coils are form wound, the armature is of the iron-clad drum type



The Sireno Horn.



Leather Tire Goods Co. Tread.



Timken New Short Bearing.

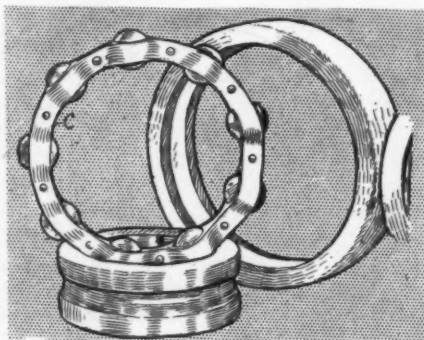
built up with steel laminations, the commutator is of hard-drawn copper insulated with sheet mica, while the turbine is of cast aluminum alloy, machined and keyed to an electric motor shaft. Operating the Sireno is by the pressure of a button on the steering wheel, on the floor, or at the side of the car or wherever the owner may wish to place it. The electric current may be had from the car's storage battery, which will not interfere with the battery doing its duty otherwise. The Sireno operates normally at from six to eight volts, but a louder tone and greater carrying power may be had by increasing the voltage. The principle involved is that of air currents generated by the rapidly revolving turbine driven by the electric motor. The air is drawn through the funnel of the siren and forced out through the peripheral openings on the principle of centrifugal force. There will be several other models, one of which is for touring cars, while there is a smaller type, called the Junior, which has a range of from one to two miles on country roads. Both of these will work from the ordinary six-volt battery.

Bearings.—Improvements noted in ball bearings for 1909 consist in several cases in increasing the number of balls in a given size of bearing, as compared with the number used this year; and the use of metal separators between the balls forming a separate cage for each ball. In roller bearings, one of the noted advances is the manufacture of the short-length bearing which occupies the same space at the annular ball type.

The New Departure Manufacturing Company in its double ball-race bearing uses an inner ring *A* with two ball grooves *V*, in which are races of balls separated by the ring spacer *S* made in V-form, with holes in either side forming ball cages, the balls in one race alternating with those in the other. The outer race is a three-part one of two cup pieces *B*, one for each ball race, and a cover *C* spanning the tops of the pieces *B* and holding them together. Ten balls are carried in each race. In its exhibit booth the company will demonstrate the dual work these bearings perform by being capable of carrying loads at various angles with 1,000-pound flywheels. In this work the bearings will be forced to carry the load at every angle from radial to absolute thrust. On exhibition will also be a transmission set which has seen 16,000 miles of road service.

Hess-Bright bearings for 1909 are in two styles, the new one brought out this year with each ball in a cage of its own, and the old style with spring separators between the balls. In the new cage type the separator is made in halves, one half entering between the balls at one side of the bearing and the other set at the other side, the halves then being secured together. The new magneto bearing has a one-piece inner race, but a two-part outer race. The products of this company are so well and favorably known as not to require description, especially if it is remembered that the H-B, D.W.F., were the first of the annular ball bearings to be used in automobiles, that is to say, annular ball bearings with a fixed adjustment.

The Standard Roller Bearing Company in its annular ball bearing employs one-piece inner and outer races and carries the nine balls in a spacer *C*, which is made in halves riveted together, the halves having semi-circular curved parts for the balls.



Standard Roller Bearing Co. Bearing.

Standard alloy tool steel is used in the balls. The company continues its full type of annular ball bearing in which the balls are introduced through a recess in the outer race. Its line includes the improved Grant conical roller bearing with solid rollers supported in end carriers with individual sockets for the ends of the rollers and which ends are riveted together forming a cage for the rollers. The cone has a wide shoulder against which one end of the roller carrier has a bearing, which shoulder has the same degree of bevel as the ends of the rollers.

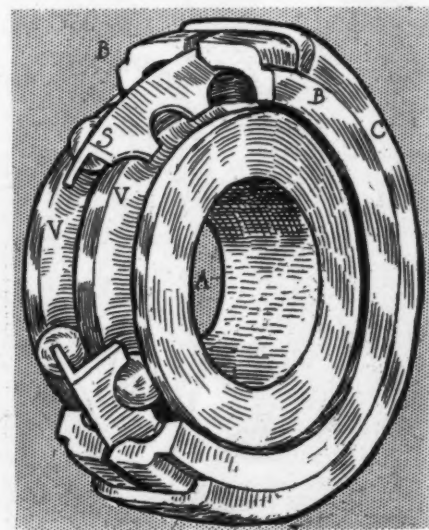
Most interesting in the line of Timken roller bearings is the short-length bearing, which is made so that it is interchangeable with the different makes of annular ball bearings and can be fitted where they can. Its design is the same as the present Timken bearing with the rollers carried in separate cages in a one-piece metal stamping.

J. S. Bretz, exhibitor of the F. & S. annular ball bearing, shows the new type, which differs from the previous one in the employment of a die-cast separator for the balls by means of which it is possible to get many more balls into a bearing, which has been one of the aims of makers of annular ball bearings. Each ball has a separate cage.

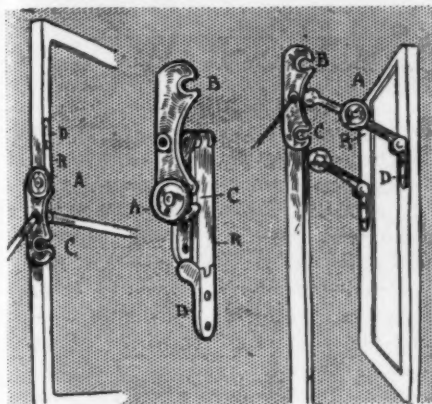
Windshields.—Windshield trend for 1909 is toward small brass frames, folding types without cross-frame pieces between the upper and lower halves of the glass where it obstructs the driver's vision, and upper halves capable of being set at any angle and of being replaced by a wire mesh insect screen for the catching of flies and insects in warm weather, when the glass protection is not needed.

Colonel Sprague, of the Sprague Umbrella Company, has ready a new No. 90 folding windshield which is an advance of previous ones of this type in that when folded the narrow central dividend strips are at the top and do not interfere with the vision. To do this the upper half is upside down when folded behind the lower half. The upper half folds through the usual brackets, which are offset to miss the adjusting nuts. This shield is made with a solid brass molding for a frame. The No. 70 shield does not invert the top half when folding and so the heavy part of the frame is across where the center of the shield when up would be. The No. 42 shield, with wood frame and hinged top half, is continued.

The No. 3 divided folding shield of the Troy Carriage & Sun Shade Company, Fig. 1, has, in brief, two upper halves, one an insect screen, *A*, and the other a glass part, *B*, each hinged at the center of its ends to a cross beam which at its center hinges to the top of the framework of the bottom half of the shield so that when the insect screen is up, the glass can be down and vice versa. On the center of the end frame of the lower half are two curved hooks for holding the insect screen or the upper glass alongside of the lower half; or, if desired, the one part can be anchored up and the other left down. This concern has a rain vision attachment for its No. 2 shield which enables the driver to see ahead in rain storms. In addition are types of folding shields with



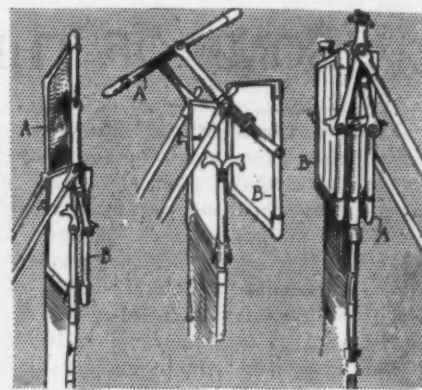
New Departure Bearing.



Vanguard Mfg. Co. Windshield.

brass and wood frames and folding from a hinge or long center arm.

The Vanguard Manufacturing Company has in its new folding windshield an example of the shield free from the cross-bar between the glass halves. The upper half hinges by a long bar *R* at each end to the lower half. Attached to the top of the lower half at each end is a bow-shaped piece with slots *B* and *C*. On the hinge rod *R* is a finger nut *A*, whose stem, when the windshield is up, enters the upper slot *B*, and with the top half folded beside the lower half enters the slot *C*. Once it is in either of these slots, tightening the nut locks it firmly in place.



Troy Sunshade-Carriage Co. Shield.

UP-TO-DATE ROLL CALL OF THE A. M. C. M. A.

THESE are the officers, members and committees of the American Motor Car Manufacturers' Association, which has its headquarters at 29 West Forty-second street, New York:

Committee of Management.

Chairman, Benjamin Briscoe, Maxwell-Briscoe Motor Co.
Vice-Chairman, R. E. Olds, Reo Motor Car Co.
Treasurer, H. O. Smith, Premier Motor Mfg. Co.
Secretary, G. Vernor Rogers, Mitchell Motor Car Co.
Auditor, W. H. Van Dervoort, Moline Automobile Co.
Charles Lewis, Jackson Automobile Co.
W. C. Marmon, Nordyke & Marmon Co.
C. G. Stoddard, Dayton Motor Car Co.
S. H. Mora, Mora Motor Car Co.
Counsel, Job E. Hedges, 141 Broadway, New York.
General Manager, Alfred Reeves.

A. M. C. M. A. Members.

Name.	Address.	Car.
Abendroth & Root Mfg. Co.,	Newburgh, N. Y.,	Frontenac
Acme Motor Car Co.,	Reading, Pa.,	Acme
American Motor Car Co.,	Indianapolis, Ind.,	American
Austin Automobile Co.,	Grand Rapids, Mich.,	Austin
Atlas Motor Car Co.,	Springfield, Mass.,	Atlas
Bartholomew Co., The,	Peoria, Ill.,	Glide
Brush Runabout Co.,	Detroit, Mich.,	Brush
Buckeye Mfg. Co.,	Anderson, Ind.,	Lambert
Cartercar Company,	Pontiac, Mich.,	Cartercar
Chadwick Engineering Works,	Pottstown, Pa.,	Chadwick
Dayton Motor Car Co.,	Dayton, O.,	Stoddard-Dayton
DeLuxe Motor Car Co.,	Detroit, Mich.,	De Luxe
Dorris Motor Car Co.,	St. Louis, Mo.,	Dorris
Ford Motor Co.,	Detroit, Mich.,	Ford
Gaeth Automobile Co.,	Cleveland, O.,	Gaeth
Gearless Motor Car Co.,	Rochester, N. Y.,	Gearless
Grabowsky Power Wagon Co.,	Detroit, Mich.,	Grabowsky
Holsman Automobile Co.,	Chicago, Ill.,	Holsman
Jackson Automobile Co.,	Jackson, Mich.,	Jackson
Kiblinger, W. H. Co.,	Auburn, Ind.,	Kiblinger
Mack Bros. Motor Car Co.,	Allentown, Pa.,	Manhattan
Marion Motor Car Co.,	Indianapolis, Ind.,	Marion
Maxwell-Briscoe Motor Co.,	Tarrytown, N. Y.,	Maxwell
Midland Motor Car Co.,	Moline, Ill.,	Midland
Mitchell Motor Car Co.,	Racine, Wis.,	Mitchell
Moline Automobile Co.,	East Moline, Ill.,	Moline
Moon Motor Car Co.,	St. Louis, Mo.,	Moon
Mora Motor Car Co.,	Newark, N. Y.,	Mora
National Motor Vehicle Co.,	Indianapolis, Ind.,	National
Nordyke & Marmon Co.,	Indianapolis, Ind.,	Marmon
Oakland Motor Car Co.,	Pontiac, Mich.,	Oakland
Overland Automobile Co.,	Indianapolis, Ind.,	Overland
Pennsylvania Auto-Motor Co.,	Bryn Mawr, Pa.,	Pennsylvania
Premier Motor Mfg. Co.	Indianapolis, Ind.,	Premier
Rapid Motor Vehicle Co.,	Pontiac, Mich.,	Rapid
Regal Motor Car Co.,	Detroit, Mich.,	Regal
Reo Motor Car Co.,	Lansing, Mich.,	Reo
Simplex Motor Car Co.,	Mishawaka, Ind.,	American Simplex
St. Louis Car Co. (Auto Dt.),	St. Louis, Mo.,	American Mors
Welch Motor Car Co.,	Pontiac, Mich.,	Welch
York Motor Car Co.,	York, Pa.,	Pullman

List of Standing A. M. C. M. A. Committees.

SHOW COMMITTEE.

H. O. Smith, Chairman.....Premier Mfg. Co.
S. H. Mora.....Mora Motor Car Co.
R. M. Owen.....Reo Motor Car Co.

TOURS & RACES.

W. C. Marmon, Chairman.....Nordyke & Marmon Co.
A. C. Newby.....National Motor Vehicle Co.
H. O. Smith.....Premier Motor Mfg. Co.

GOOD ROADS.

Charles E. Lewis, Chairman.....Jackson Automobile Co.
James Couzens.....Ford Motor Co.
R. E. Olds.....Reo Motor Car Co.
H. B. Krenning.....Dorris Motor Car Co.

LEGISLATION.

R. E. Olds, Chairman.....Reo Motor Car Co.
C. G. Stoddard.....Dayton Motor Car Co.
A. C. Newby.....National Motor Vehicle Co.
R. A. Palmer.....Cartercar Co.
R. E. Graham.....Acme Motor Car Co.

MEMBERSHIP.

W. H. VanDervoort, Chairman.....Moline Automobile Co.
Morris Grabowsky.....Rapid Motor Vehicle Co.
S. H. Mora.....Mora Motor Car Co.

ADVERTISING AND PUBLICITY.

J. N. Willys, Chairman.....Overland Automobile Co.
G. B. Louderback.....Buckeye Mfg. Co.
L. M. Bradley.....New York Office, Manager.
Chas. E. Duryea.....New York Office

FINANCE.

James Couzens, Chairman.....Ford Motor Co.
W. G. Morse.....Atlas Motor Car Co.
J. B. Bartholomew.....The Bartholomew Co.

STANDARDIZATION & TECHNICAL.

John D. Maxwell, Chairman.....Maxwell-Briscoe Motor Co.
Henry Ford.....Ford Motor Co.
R. E. Olds.....Reo Motor Car Co.

FREIGHT & TRANSPORTATION.

Harry Knox, Chairman.....Atlas Motor Car Co.
H. W. Mack.....Mack Bros. Motor Car Co.
R. Harry Croninger.....Pennsylvania Auto-Motor Co.
J. N. Willys.....Overland Automobile Co.
C. C. Hanch.....Nordyke & Marmon Co.

TIRES.

G. V. Rogers, Chairman.....Mitchell Motor Car Co.
James Couzens.....Ford Motor Co.
Frank Briscoe.....Brush Runabout Co.
O. Stevenson.....York Motor Car Co.

AGENCIES.

W. H. VanDervoort, Chairman.....Moline Automobile Co.
A. R. Welch.....Welch Motor Car Co.
H. R. Mallow.....DeLuxe Motor Car Co.
Frank L. Pierce.....Gaeth Automobile Co.
H. B. Larzelere.....Chadwick Engineering Works.

SOME OF THE GOSSIP OF THE PALACE SHOW

Premier Centuryite at Show.—

The famous Premier Century car is at the Palace show, whither it came after a very strenuous journey from the factory in Indianapolis. This trip was made by a roundabout route which necessitated crossing the Blue Ridge and Allegheny mountains. This run of 1,805 miles from Indianapolis to New York, including stops, was made in 84 hours of actual running time, a large portion of which was made by night. The route lay via Dayton, Columbus, Cleveland, Pittsburgh, Hagerstown, Washington, Baltimore, Wilmington and Philadelphia. The speedometer now registers 15,799.7, which is the total of the Premier Century in seventeen States. The ignition is announced to have been perfect during the entire grind, and the original set of igniters is still as good as new. Even the platinum points show no wear at all, and measure up perfectly with new sets. The igniters have only required slight cleaning, without adjustments, every 2,500 miles.

Velie Manager at Hotel Astor.—H. G. Moore, manager of the Chicago branch of the Velie Motor Vehicle Company, of Moline, Ill., is at the Hotel Astor, for the week of the Palace show, for the purpose of negotiating with Eastern dealers for agency contracts of the Velie cars during 1909. Mr. Moore recently severed his connection with the McDuffee Automobile Company, of which he was secretary, and established a branch house for the Velie company at 1615-17 Michigan avenue. The building now occupied by the Packard agency has been leased, the latter interests intending to move in the Spring. In addition to managing the Chicago branch, Mr. Moore will have supervision of the Velie agency department east of Chicago. The Velie Company is an old firm in the manufacture of implements and vehicles, and, in addition to the business managed by Mr. Moore, its product will be handled in the West by the John Deere Plow Company, of Omaha and Kansas City, and the Deere & Weber Company, of Minneapolis, these firms acting as wholesale distributors.

Continental Tire Contest.—In order to demonstrate the advantages to be obtained by equipping a car with Continental tires and the Continental demountable rims, the Continental Caoutchouc Company offers a prize of \$5, to be awarded each day of the show, to the owner, driver, or prospective owner of a car making the best time in changing tires with the Continental demountable rims, while at the end of the week a prize of \$20 will be awarded to the person having made the best record throughout the course of the show. All official records will be carefully tabulated and the books kept open for examination at all times. Those unfamiliar with the advantages of Continental tires and rims are particularly invited to call at space 170 and watch the demonstrations. They will be allowed two trials in the contest.

Splitdorf Fiftieth Anniversary.—There are probably few exhibitors in the entire Palace show, in whatever line of manufacture, who can look back upon half a century in business. This is the proud record of the Splitdorf Laboratory, the fiftieth anniversary of which was celebrated just prior to the opening of the show. The business was established by Henry Splitdorf in Philadelphia in 1858 as a laboratory for those desiring to experiment with electricity. During the Civil War it was the



only plant in the country engaged in the manufacture of electrical detonators, and accordingly prospered. On the occasion of the birth of the present owner, the business was removed to Center street, New York, later going to Vandewater street, in 1888, when Charles Splitdorf assumed control. Last year the business, having entirely outgrown its downtown quarters, was removed to a modern factory building of its own on Walton avenue, the Bronx.

Rapid Truck's Long Trip.—Not to be outdone by the pleasure vehicles, the commercial cars have at least one representative which came to the show under its own power. This is a truck made by the Rapid Motor Vehicle Company, of Pontiac, Mich. Leaving the factory December 20, this one-ton machine, which is the same one that went through the Glidden tour, came

by the long Northern route, through Toledo, Cleveland, Erie, Buffalo, Rochester, Syracuse and Albany, and, as was the case during the tour last Summer, the truck was loaded with Good-year air bottles. After completing the Glidden, the truck was dismounted and its parts calipered, but investigation showed the wear to be hardly noticeable. Since that time it has received no attention, its mileage up to date being 2,021 miles, plus the distance to New York.

A Good Press Agent Is a Good Asset.—Effectively distributing and also getting into print the publicity concerning an automobile show is an art, and, judging from the generous amount of material printed in the daily papers, "Dunc" Curry made a successful job of it this year. While "Dunc" occasionally takes a little exercise in hammer-throwing, his work juggling is always well done, and consequently read even by those who do not always agree with him.

Two Showing Exhibitors Who Are Not in the Show.—Following its usual custom, T. B. Jeffery & Company, makers of the Rambler, are doing their exhibiting in plenteous fashion at their New York salesrooms, 38 West Sixty-second street, where Homan & Schultz have a full line on view. In similar manner the American Locomotive Company is exhibiting the "Alco," formerly known as the Berliet, at the Waldorf-Astoria.

Second A. M. C. M. A. Show Issue, January 6.—In the issue of January 6 THE AUTOMOBILE will give thorough attention to the accessories exhibited in the Grand Central Palace show, covering the things that are new or have demonstrated value to users and builders of automobiles.

Smoker at the A. C. A.—Invitations have been issued by the Automobile Club of America to the trade and visiting automobilists for a smoker which will be held at the clubhouse, in Fifty-fourth street, west of Broadway, Saturday evening. Orrell A. Parker, chairman of the entertainment committee, has prepared an attractive program, and at the conclusion of the entertainment refreshments will be served.

Belated Exhibitors.—Early in the proceedings it was a little difficult to induce some of the exhibitors to come forward and take space; they were waiting for indications of the trend of events. Most of the belated ones took the best space they could get at the last moment, but a few of them failed to get any space at all, although it is true they would have been willing to take the standing room that is reserved for the patrons of the industry.



PARIS, Dec. 25.—Problematical as the aeronautic situation may seem to the novice, it is a fact that the participants in events that of late have astounded the world are in dead earnest, and the first exhibition is therefore worthy of full notice. The salon opened on the day after Christmas, under the most happy auspices, with an attendance which can only be described as "sardinistic." Strange to relate, in spite of the activities in the aeronautic zone that centers around Paris, but a small part of the vast population were previously enabled to observe the doings, and they flocked to the salon as if they feared the passing of the last chance. Our own Wilbur Wright and his doings in the aeronautic line are now regarded as only to be equaled, and seeing the aeroplane is next to seeing him. Wright himself was not present at the opening.

President Fallières informally opened the exhibit at one o'clock Thursday afternoon, but he was followed and preceded by such a large crowd that it is hardly possible that he had a chance to see much, and if he wants to study aeroplanes he will have to go later, during the salon's last days.

One large dirigible balloon, suspended high overhead, runs across the entire breadth of the Grand Palais, but most of the airships, huge, bird-like affairs, rather awkward when seen so close, are on the ground, where they may be carefully studied.

Unfortunately, the Wilbur Wright aeroplane was not in position when the exhibition opened. But Hart O. Berg worked away all day, and on the second day of the exhibition it was ready to be seen. In spite of the fact that nothing but the motor was visible of the Wright aeroplane during the greater part of Thursday, it was impossible to get a glimpse of the stand without waiting several minutes, the crowd was so great.

The Blériot exhibit is very popular. This inventor showed his biplane and his new models of monoplanes, as yet untried, with which he hopes to do great things. The features of the new Blériot biplane are highly interesting. The machine's supporting surface is 65 square yards, to which must be added 6 square yards of balancing wings. The motor is a 40-horsepower Antoinette engine, driving by chain transmission, with a four-bladed Vickery propeller, giving 480 revolutions. Two rear auxiliary planes, having a total surface of 24 square feet, are placed on each side of the steering apparatus, which is a striking novelty and will create a great sensation, being placed in front. The

machine is directed by means of a single lever. The rise and fall are managed by means of the front runner, made out of lateral inside planes.

Another exhibit is the Delagrang machine, better known to the public than most others, and yet it has attracted great interest, and a crowd has also hovered about Henry Farman's stand. The Breguet gyroplane of the same type as the one which was tried with little success last Summer near Douai is also here.

Another important exhibit is that of the Esnault. Successful flights were made near Versailles by this inventor. It will be remembered that the chief feature of this machine, which is of the single-plane type, is its extreme lightness, the body being of aluminum and wood, covered with thin gutta percha cloth. The 25-horsepower five-cylinder motor and the four-bladed propeller are in front of the aviator's seat, being placed in the main body of the aeroplane.

One of the most interesting exhibits is that of M. Ader's "Avion," which has been brought from its place in a museum. This ancestor of the modern aeroplane was invented fifteen years ago, but at that time the military authorities laughed at Ader, although he succeeded in flying some distance. Utterly discouraged, Ader destroyed all his papers. The subsequent successful aeroplanes have proved, however, the correctness of his theories.

First Aeronautical Port and Aerodrome.

PARIS, Dec. 24.—Ten miles to the south of Paris, on the outskirts of the little town of Juvisy, is the first aeronautical port and aerodrome ever constructed. The perfectly flat field, over 250 acres in area, has a circular track of about two miles, a straightaway of one mile and surrounding it sheds for aeroplanes and dirigible balloons, workshops and garages, coal and hydrogen gas plants, observation towers, grandstands and postal and telegraph offices. The aerodrome, being on a vast plain within easy distance of the French capital, will doubtless serve as a landing place for airships and aeroplanes traveling from the provinces to Paris. The ground is specially prepared for the testing of new aeroplanes and the tuning up of machines, which will later take longer flights over the plains stretching for miles in all directions. The opening ceremony of the aerodrome, to be attended by a deputation from the Senate, has been fixed for Sunday, January 10.

Blériot's Four-Passenger Flyer.

PARIS, Dec. 24.—Louis Blériot, apostle of the monoplane type of flying machine, has turned to Wright models for the four-passenger flyer that is now nearing completion in his private workshops. The main bearing surfaces are exactly the same length and have the same curve as those on the American's machine, the only difference being a slight increase in depth from front to rear. The position of the engine and of the two seats is also identical with that of the aeroplane from Dayton. Instead of two separate propellers, however, there is only one, with four blades, driven, as in the case of the Wright machine, by means of a chain. Here the similarity ceases, for, instead of the two elevation planes at the front and the lateral rudder at the rear, Blériot has adopted the contrary disposition, the steering being done by three lateral planes carried in front and pivoting together. Change of altitude is obtained by means of small rear supplementary wings, pivoting at the end of what may be regarded as jibs carried at each extremity of the main bearing surfaces.

The apparatus which at first sight so closely resembles that of the American champion is full of differences on closer examination. In the first place, the workmanship, instead of being crude and amateurish, as on the successful American aeroplane, is of the very highest throughout. The power plant is an eight-cylinder Antoinette water-cooled engine, developing 50 horsepower and driving the propeller at 480 revolutions a minute. The two front seats are placed in the same position as those on the Wright flyer, but, instead of being rough boards covered with rougher sacking, they are comfortable cane-bottom office chairs with the legs cut off. Immediately behind them are two more seats to be

occupied by passengers. The radiator is an ingenious arrangement, carried to the left and right of the pilot between two of the uprights. It really consists of a mass of hollow aluminum rings attached to the canvas vertical division, and united one to the other by means of short lengths of rubber tube, the top and bottom rows each being united to a collector.

The aeroplane is mounted on small wire wheels fitted with very large section pneumatic tires. Hydraulic shock absorbers are also employed for the front suspension. Instead of the two wooden levers that Wright has made familiar, the forward rudder is operated by means of a vertical column and automobile wheel, a lever, similar to that on Pierce cars, being carried underneath for the control of the rear elevation planes. Instead of plain linen roughly tacked or sewn in position, the main bearing surfaces are covered with fine rubbered cloth, as used for balloons. Louis Blériot promises to be out shortly with his new apparatus and to carry all the passengers for whom he has provided seats.

Rules for Europe's First Aeroplane Races.

PARIS, Dec. 24.—Regulations are now out for the Monaco aeroplane races, the first of their kind to be held, and which have been scheduled for January 24 to March 24 in the Bay of Monaco. Any type of machine heavier-than-air is admitted, provided it carry with it its own source of power. Three flights must be made over the official course on three different days, the aeroplanes starting from the port of Monaco without touching the sea-wall, flying across the bay, and rounding a red and white flag which will be placed at the extremity of Cape Martin, a return being made to the starting point. The time will be taken as the flying machine crosses over the sea wall on the outgoing and return trip. Total distance in a straight line is 5.9 miles.

There are no restrictions on the methods of starting, or on the place from which the machine shall leave the ground, the official start being considered when the aeroplane crosses over the sea wall. After crossing over the finishing line the flying machines may come back to earth in any way desired and at any place that may be most convenient. A suitable type of float, capable of bearing the apparatus on the surface of the water in case of accident, will be insisted upon, the efficiency of the apparatus to be judged by the committee. Only pilots who have already given proof of their ability to handle an aeroplane shall be allowed to take part in the race, the committee to be sole

judge of ability. If the pilot of the machine is not able to swim, the organizers shall have power to insist on the wearing of a life belt.

Attempts may be made on any day from January 24 to March 24 between the hours of 10 a. m. and 5 p. m., on condition that the committee has been informed not later than 9 o'clock of the same day of the intention to fly. The number of attempts are unlimited, the three fastest on different days being added to give a basis of classification.

Prizes are \$15,000 in cash for the first, \$3,000 for the second, and \$2,000 for the third, the committee having the right, in case of a very small number of entries or indifferent performances, to change the prize list as they may think suitable. Entries are received until March 1, at midnight, at the International Sporting Club of Monaco, the fee being \$20 per entry.

If dimensions of the apparatus are given when the entry is made, the committee will undertake to erect sheds on the shore to house the flying machines, responsibility for accident being with the owner of the apparatus. Any shed abandoned for twenty-four hours will become the property of the committee, which may dispose of it as it thinks fit. Protests will only be received when accompanied with a fee of \$20, and must be handed in the same day within one hour of the close of the day's racing.

Although it is not yet known what machines will take part in the competition, it is believed, from the number available, that the entry list will be a satisfactory one. Wilbur Wright having taken up his winter quarters at Pau, and his brother being expected in Europe very shortly, it is believed that both will take part in the Monaco races. Farman and Delagrangé are certain starters; others having machines suitable for this contest are Santos-Dumont; Voisin Frères, with several different types of aeroplanes; Voisin Frères, with several machines; Comte de Lambert, Paul Tissandier, and others having bought Wright aeroplanes; Louis Blériot, with both monoplane and biplane flyers; Robert Esnault-Pelterie, with monoplane machines; Moore Brabazon, with a Voisin Frères biplane; Capitaine Ferber, on an Antoinette machine; Bayard-Clement Automobile Company, with a biplane driven by a new type of seven-cylinder gasoline engine; Melvin Vaniman, with triplane machines, and Goupy, also with a triplane. The distinct favorites are Wright, Farman, and Delagrangé, among whom the contest is likely to be keenly disputed.

QUESTION OF 1909 SALON SOMEWHAT COMPLICATED

PARIS, Dec. 24.—"There will be an automobile Salon in Paris in 1909," declares the committee of the Automobile Club of France. "If there is, we will not take any part in it," declare a group of the most important constructors of this country. Between the two the outlook for the continuance of the annual exhibition in the Grand Palais on the Champs-Élysées is not very promising, for the firms having signed an agreement not to exhibit at any show next year, comprise Renault, Panhard, Brasier, Delaunay-Belleville, Dietrich, Berliet, Mercedes, Germain, Isotta-Fraschini, Bollee, Minerva, Pipe and Darracq. If they remain true to their agreement—and the penalty for breaking away is \$10,000—the annual show will next year be either a failure or a second rate affair.

When the matter came before the committee of the French Club last week, there were two parties; the one representing a group of French constructors moved that in the interest of both users and constructors of cars there should be no exhibition next year in Paris or surrounding district, and that in future shows should be held every two years. The opposing party, led by the Marquis de Dion, maintained that the best interests of the industry would be served by holding the show as usual. It was this proposition that was carried by 34 votes to 18, the majority comprising a small number of big constructors and a large num-

ber of persons who are but private users of cars. As the minority is more representative of the French industry than the majority, the vote in favor of a continuance of the show is not looked upon as very important.

There is, however, a possibility of the anti-show men shifting their position when it is discovered that London has no intention, either of alternating with Paris or holding a show every two years on same dates. This was foreseen in the proposition of the minority, who put in a clause to the effect that if the show were held it should be of an economical and co-operative nature.

The Automobile Club of France, receiving considerable financial benefit from its annual exhibition, will naturally do its best to maintain it, and will probably succeed by offering to hold the next show on economically commercial lines to suit the dissatisfied constructors. So long as it is shown that the exhibition can be a source of profit and not of loss to the exhibitors, French constructors will be willing to come into it. Up to the present it is the club that has taken the plums, the advantage to constructors becoming less and less as the automobile has secured its position as an article of necessity.

In all probability 1908 will be the last of the fancy spectacular shows, and 1909 and succeeding years will see an exhibition in the Palais designed solely for the selling of automobiles.



BEFORE entering into discussion it should be here stated that wherever mention is made of the proportions of a mixture reference is made to the ratio by weight. Volumetric relations in such considerations are confusing and tend toward misleading deductions. Chemical reactions involve a definite weight relationship between the active substances. Combustion is a chemical reaction, and, as such, requires just so many pounds of oxygen for the complete reduction of a certain number of pounds of a given fuel. The weights of the substances can bear but one ratio to each other; while the volumetric ratio of combination may vary almost infinitely, because the factors of temperature and pressure must then be dealt with.

If the maximum temperature of combustion and its maximum pressure are to be utilized in an engine cylinder, its structure must be such that the molecules of the combining substances are in their proper positions relative to each other, i.e., each molecule of fuel closely surrounded by the correct number of oxygen molecules before the occurrence of the ignition spark. This calls for the finest possible division of the fuel and its most thorough mixing with the air.

The Real Carbureter.

The accepted type of carbureter, taken together with its distributing manifold, forms a surface carbureter usually of quite small surface. The manifold walls form the real carbureter, and the device called the carbureter furnishes the fuel to that surface, from which any proper vapor that may exist in the final mixture is carried by the passing mixture of air.

By "typical carbureter" is meant a device in which liquid fuel is brought into contact with a moving column of air by the same pressure depression which causes the air to flow, i.e., it is drawn through a passage by the motor suction simultaneously with the influx of the air with which it mixes to form the explosive mixture.

In the "typical" device, fuel is carried by flowing air from the open end of a passage located in a region of pressure lower than that of the atmosphere to which the other end is open. Lowered pressure without a correspondingly lowered temperature tends to cause vaporization. It is undoubtedly true that vaporization starts at this point as soon as the fuel has fairly left the nozzle. The intensity of this action depends upon the extent to which the pressure is lowered. The pressure reduction about the nozzle may be taken at .5 pounds per square inch, which value increases through the manifold to the valves until it reaches a value of 6 to 8 pounds with some six-cylinder engines.

Under carbureter conditions it is impossible to measure or even approximately estimate the extent of the vaporization, at the nozzle or through the manifold, due to this pressure reduction; but it is known to be very appreciable in its effect. It should be considered as a condition affecting vaporization, at the nozzle end but slightly, but to a much greater extent after the fuel has become suspended in the air.

Distinction in Vaporization.

Vaporization due to pressure reduction is distinguished from vaporization caused by the supplying of heat. In the former action, vaporization can become only partially complete, however far the process of reduction is carried, since the part of

the liquid which vaporizes does so through the abstraction of heat from the remainder, which becomes constantly colder, until finally the temperature of the liquid is so low that vaporization ceases until heat is supplied from some outside source. Where vaporization is brought about entirely by heat from some outside source the degree to which it may be carried depends wholly upon the amount of heat supplied, since the temperature of the liquid is being constantly raised to or maintained at the proper point.

In the carbureting device under consideration neither of the above processes is carried to the limit, nor goes forward alone and unmodified. They are called into action simultaneously. The reduced pressure due to motor suction causes vaporization with a lowering of the temperature, and the heat of the air tends to cause vaporization through a transfer of heat from itself to the liquid. Thus it appears that each of these vaporizing actions assists the other—the air supplying heat to the liquid as it is cooled by vaporization under reduced pressure, and the reduction in temperature due to pressure reduction facilitating the transfer of heat from the air to the liquid.

Within the temperature and pressure ranges available, the liquid must present, relatively, an enormous surface to the air if vaporization is to be sufficiently rapid. To this end the passage through which the liquid flows is so formed that the liquid is broken up into a spray by the velocity of its effluxion due to the difference between the pressures existing at the two ends of the passage.

In any one carbureter the perfection of vaporization is proportioned to the fineness with which the liquid is broken up at the nozzle. The shortness of the time within which vaporization must be completed is what causes the above factor of fineness of division to enter. Since the heat transfer between the air and the liquid, or the passage walls and the liquid, is affected chiefly through the agencies of convection and conduction—the former implying a rapid agitation and relative motion between the particles of the two substances, and the latter the exposure by the liquid of the greatest possible surface areas—it is readily seen that the finer the fuel division at the nozzle the more rapid and complete will be the vaporization and the greater the homogeneity of the final mixture.

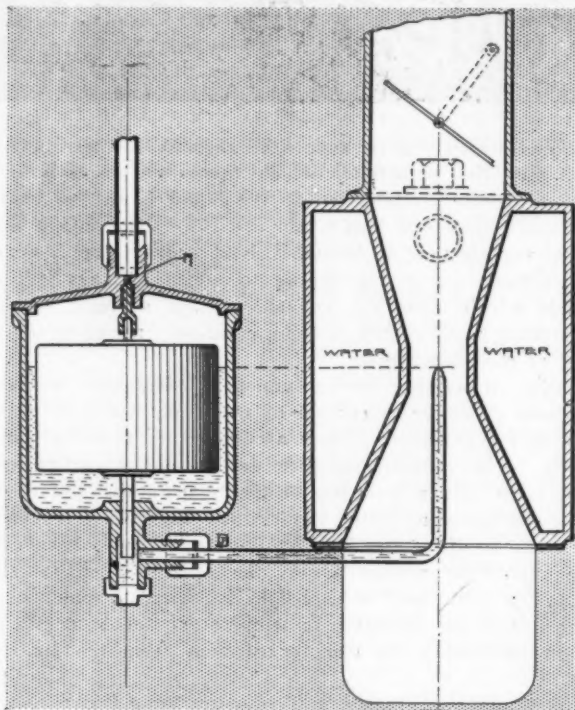
Fuel Division Usually too Coarse.

In the coarseness of the fuel division lies the chief failures of the typical carbureter. This has been proven again and again by any number of experimenters. Those who have constructed transparent mixing chambers for the observance of nozzle action have invariably found that the fuel left the nozzles as a solid stream or in heavy globules and irregular "chunks," not as a fine spray or mist, as it is supposed to do. Improved design and workmanship on the nozzle and needle valve parts will almost entirely overcome this poor action, with an increase in power output and fuel economy; but any nozzle form used will give a wet and sloppy discharge with low engine demands, even though a true spray may be delivered with increased demands.

Whatever form is given the nozzle, the effectiveness with which it can break up the fuel varies as the difference between the pressures at its two ends, and, as this pressure dif-

ference varies throughout the speed range of the engine, the fineness will also vary. At high engine demands the spray will be better and finer than at low; but this is absolutely necessary, since the time allowance for vaporization is less and the quantity of mixture formed is greater.

The nozzle of average performance will, at medium engine demands, deliver a thin conical sheet of liquid. This liquid



Characteristic Type of Float Feed Carburetor.

cone is torn away at its edge and carried on by the air column. Some of the fuel torn away is in small enough particles to be considered as spray or mist, and may be taken as contributing directly to the vapor content of the mixture; but the greater part sooner or later strikes some part of the containing walls, from which it is later picked up in the form of globules. These globules are continually picked up and thrown out by the air stream in its progress to the cylinders, until some of them are sufficiently small to become permanently entrained or have been completely vaporized.

Bends in the manifold passages aggravate the expulsion of the liquid globules, but they also permit of fuel once thrown out being readily picked up again. The persistence of rectilinear motion comes into play and throws out the heavier globules at the turns, they being again picked up by a following portion of the air column. This action is repeated at each.

In the foregoing it may seem that the vaporization accomplished by pressure reduction has been placed on a par with that brought about by the heat supply available in the air and passage walls. It is not meant that such an impression be taken. The rate of transfer of heat from the air and walls to the liquid will, of course, be higher the greater the temperature difference; the lowering of the pressure lowers the temperature of the liquid through partial vaporization, and thus increases the temperature difference. Thus, while vaporization could not go on at a proper rate without such a heat supply, the lowered pressure under which vaporization takes place is an important adjunct, second only to the heat supply.

Fuel Economy in High Velocities.

The fuel economy resulting from the use of air velocities higher than the average, and thus lower pressures, is quite marked. Of course, with high charge velocities the maximum power is not realized above a certain piston speed; but the fuel economy and efficiency will be greater within the range which

the high velocity device can supply without too great a loss per cylinder charge. This latter fact is easily demonstrated by making two series of runs with any multiple cylinder automobile engine. One series should be made with carburetor and manifold passages of such areas that an average charge velocity of about 8,000 feet per minute is had at a piston speed of 1,000 feet per minute; and the other series with passages which will give the above charge velocity at between 600 and 700 feet per minute piston speed.

A comparison of the two series of runs will show that up to that piston speed at which the volumetric efficiency of the engine pumping strokes falls off because of too high a charge velocity the power deliveries are approximately equal, the fuel consumption per brake horsepower hour and the thermal efficiency have each been improved. The passages giving the above charge velocity at the higher piston speeds will permit of the development of a greater power at those speeds, and are thus superior from the viewpoints of maximum economy and efficiency at maximum output, which is the condition desired.

The points which it is desired to bring out are: that the greater the pressure drop in the passages the more perfect will be the breaking up of the fuel, the more rapid will be the agitation and internal motion in the mixture column, the greater will be the vaporization due to pressure reduction; and, as a final result, the fuel will be more thoroughly vaporized, and the mixture more homogeneous. There are in present practice several examples of the above utilization of high air velocities and low pressure in the carburetor passages. In the best of these the maximum charge velocity in the manifold and past the valves is kept down to the value given above (8,000 ft. per min.); and the high velocities and low pressures are secured in the carburetor passages through several spraying nozzles, each located in a separate, small passage. These are put into communication with the manifold in a progressive manner in accordance with the engine demand; and thus practically constant, high air velocities and low pressures are maintained, no matter how many or how few are serving the engine.

The advantages possessed by such a device for the vaporization of the fuel are apparent, though it appears that these devices were primarily designed with a view to securing a more automatic proportioning of the mixture.

Heating Usually Necessary.

If the nozzle and the conditions under which it operates are such that a true mist-like spray is delivered into the air column, no recourse need be had to air or wall heating devices providing the temperature of the air is 60° F. or higher. But, since such conditions very rarely obtain in practice, the expedient of heated air or jacketed mixing chamber walls must often be resorted to.

Because all liquid hydrocarbon fuels are variable and unstable, both their chemical compositions and physical characteristics, it is very difficult to formulate their actions or determine the best conditions under which to utilize them. Experimental data are placed at an equal disadvantage with mathematical and theoretical analyses in that the exactitude of either method is impaired by the non-uniformity of the substance. However, serviceable figures are entirely within reason; and as such the writer submits the following.

The hydrocarbon known as motor gasoline, specific gravity between .70 and .73, is a mixture of individual substances, each combining carbon (C) and hydrogen (H) in varying proportions. A small percentage of oxygen (O) is often present (never to exceed 3.5 per cent.), but, because of its smallness and sometimes total absence, it will be neglected. The several substances composing gasoline are all of the methane series, the chemical formula for which is expressed $C_n H_{2n+2}$. This means that for the entire series, which comprises some eighteen substances, each combines C and H in the proportion of twice as many atoms plus two of H as there are atoms of C.

The first member of the series present in gasoline, pentane,

C_6H_{12} , has a specific gravity of .626; the last member, decane, $C_{10}H_{22}$, has a specific gravity of .736. The other members between these two have specific gravities ranging between the two values given and corresponding to their increasing molecular weights. The second member of the series, hexane, C_6H_{14} , is the representative constituent of gasoline, being present in greater quantities than any of the others. Traces of pentane or the members beyond nonane, C_9H_{20} , specific gravity .723, are seldom found in gasoline. Thus, hexane, though much lighter and more readily vaporized than the several heavier members occurring with it, should be used as the basis for any calculations. This use is justified by the high vapor pressure of hexane, as will be explained later.

Chemical Composition.

Taking the chemical composition of hexane, C_6H_{14} , as that of gasoline, its combination with the oxygen of the air to form carbon dioxide, CO_2 , and water (or rather steam), H_2O , may be expressed $2C_6H_{14} + 19O_2 = 12CO_2 + 14H_2O$. From the atomic weights of the elements involved, the weight of air necessary for the complete combustion of 1 lb. of C_6H_{14} is found as follows.

The atomic weight of C is 12, that of H is 1, and that of O is 16; thus the molecular weight of C_6H_{14} is $6 \times 12 + 14 \times 1 = 86$; and the weight of the combining oxygen $19 \times 16 = 304$. Thus

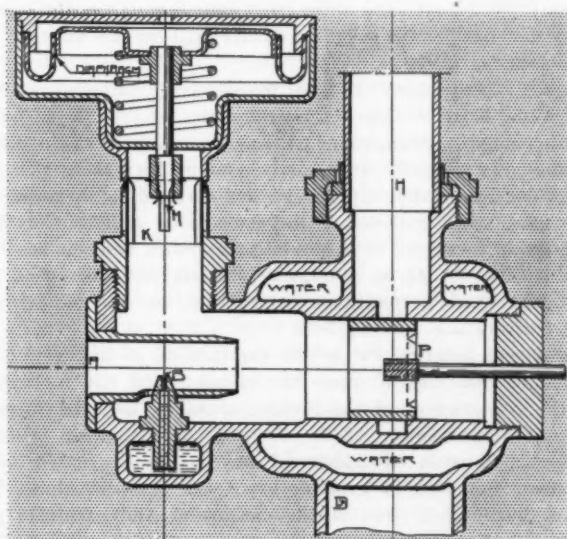
for the complete combustion of 1 lb. of C_6H_{14} , $\frac{304}{86} = 3.54$ lbs.

of oxygen will be required. Since 1 lb. of dry air at 60° F. and 14.7 lbs. pressure contains only .23 lbs. of oxygen, $\frac{3.54}{.23}$

$= 15.39$ lbs. of air are necessary for the complete combustion of 1 lb. of gasoline. This mixture proportion of 1 : 15.4

is known empirically to be that which will develop the highest temperature and pressure in a gasoline engine cylinder with a compression pressure of 70 to 80 lbs.

Before proceeding to the heat necessary for fuel vaporization, it should be determined at what lowest temperature the proportion of 1 of fuel to 15.39 of air, as above, can be maintained. There is a definite limit to the amount of vapor that can exist in a unit volume of mixture at any given temperature. If the



Section of the Krebs Type of Carburetor.

vapors of such substances be treated as gases, because of the then great expansion, the weight of fuel vapor present at any one temperature is proportional to the vapor pressure of that substance at that temperature.

Thus, the amount of gasoline vapor that can exist in a unit volume is measured by the vapor pressure of saturation for that temperature. That is, if air be saturated with gasoline

vapor at a certain temperature and pressure, a lowering of the temperature (the pressure remaining constant) will cause a condensation of some of the vapor, and consequently an impoverishment of the mixture. To apply this:

Densities Proportional to Weights.

Since the densities of gases are proportional to their molecular weights at the same pressure and temperature, and the molecular weight of H is 2, that of gasoline being taken as 86, the density of gasoline vapor is to that of H as 86 : 2, or is 43 compared with 1. Therefore the vapor pressure of 1 lb. of gasoline vapor

is — that of an equal weight of H occupying the same volume.

Also, the density of air is 14.44 times that of H; and thus 15.39

lbs. of air has a vapor pressure of $\frac{15.39}{14.44}$ times the vapor pressure of 1 lb. of H occupying the same volume.

Hence the pressure of the gasoline vapor in a mixture of the proportion 1 : 15.39 is to that of the air in the mixture as 1 : 15.39

$— = —$, or as .0233 : 1.065, from this ratio it follows that 43 : 14.44

$— = —$ or .0214 of the total vapor pressure exerted by the mixture is due to the gasoline vapor, and that

$\frac{.0233}{1.065}$ or .9786 is due to the air in the mixture. If the

mixture is under atmospheric pressure of 14.7 lbs. per square inch, there will be exerted by the gasoline vapor a pressure of

$.0214 \times 14.7 = .315$ lbs. Tables of vapor pressures show that gasoline vapor can exert a pressure of .315 lbs. at all temperatures above 1.5° F.

It appears that gasoline-air mixtures of 1 : 15.39 can exist at or above 1.5° F. under atmospheric pressure. If the pressure is less than atmospheric, or the ratio of fuel to air is decreased (it will be about 1 : 17 or 18 in average practice), the mixture will persist without a condensing out of any of the fuel vapor at temperatures lower than 1.5 F.

In the above determination of the temperature referred to fuel vapor pressure, the value given is a little high. Only the vapor pressure due to the hexane is there considered. While hexane is the characteristic of gasoline because of its occurrence in great quantities, the total vapor will be the sum of the vapor pressures of the various substances taken at the given temperature. Thus, the two pentanes (iso- and normal), C_5H_{12} , though usually present in insufficient quantities, having higher vapor pressures than the hexane, will tend to raise the vapor pressure, at a given temperature, above that due to the presence of hexane alone. Likewise, the constituents of gasoline heavier than hexane—heptane, octane and nonane—contribute in some part to the total vapor pressure. From this it appears that any error that may be introduced, by the assumption that the vapor pressure and other characteristics of hexane are those of gasoline, is toward an overestimation of the temperature, and will thus fail to effect the results.

Latent Heat of Vaporization.

The specific heat or amount of heat measured in B.T.U. (British Thermal Units) necessary to raise 1 lb. of gasoline 1° F. is .500. Hence a drop of 1° F. in the temperature of 1 lb. of gasoline corresponds to the dissipation of .5 B.T.U. The specific heat of air at constant pressure is .2375; and a drop of 1° F. is attended by the dissipation of .2375 B.T.U. per lb. of air. Taking the mixture proportions as 1 : 15.39, as above, the heat available per ° F. of drop in the temperature of the mixture is $1 \times .500 + 15.39 \times .2375 = 4.155$ B.T.U.

Since the latent heat of vaporization is very approximately 210.5 B.T.U., it follows that this 210.5 B.T.U. must be supplied

by the ingredients or by heat from some outside source applied directly to the fuel.

Consider the heat supply in the mixture ingredients themselves. Since the mixture, 1 : 15.39, is capable of supplying 4.155 B.T.U.

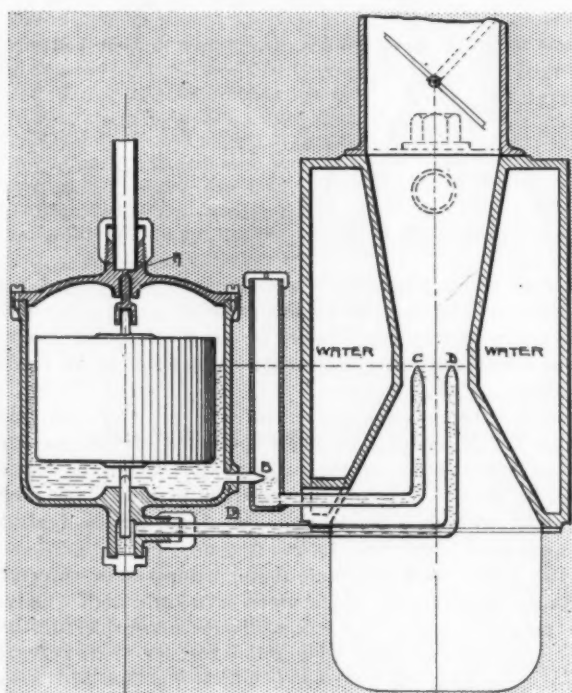
210.5

per ° F. of drop, it will require a drop of $\frac{4.155}{210.5} = 50.66^\circ \text{ F.}$ in

4.155

the mixture to completely vaporize the 1 lb. of fuel contained therein. The mixture, 1 : 15.39, cannot exist below 1.5° F. , so, it will be necessary that both the air and the gasoline have a temperature of at least $1.5^\circ + 50.66^\circ = 52.16^\circ \text{ F.}$ before the commencement of vaporization. If the mixture is 1 : 18, it can exist at -5.8° F. , and the initial temperature of the ingredients must be at least 38.3° F.

If the requisite amounts of fuel and air are placed in a vessel insulated from outside heat, the above initial temperature values will hold only when the time allowance for vaporization is unlimited. Compared with the short time in which vaporization must be completed in an automobile engine, the passage of time before vaporization would be completed would be almost



Principle of the Zenith Type of Carburetor.

infinity. However, there are three methods whereby the rate of vaporization may be accelerated: either the fuel may be introduced in a finely divided form; or the initial temperatures of the mixture may be made higher than the above values; or a combination of both methods may be employed.

In any case, the temperature drop can be no more than 45° F. in any mixture of gasoline and air. Therefore, if an increase in initial temperature is resorted to, the final temperature will be higher than that necessary to support the mixture proportions by just the amount that the initial temperature is raised. Suppose an initial temperature of 100° F. and a drop of 45° F. The resulting final temperature in the mixture will be 55° F.

In consideration of the form in which the fuel is presented to the air in the average carburetor, this final temperature will be higher than 55° F. because the total amount of fuel will *not* have been vaporized, and the amount of heat necessary to complete the vaporization will remain in the mixture as a temperature value. But suppose the vaporization to have been completed in two cases with a final temperature of 55° F. in one and 1.5° F. in the other. Since the same amount of fuel is present, the volumes per lb. of the two mixtures, at the same pressures, may be taken as bearing the same relationship to each other as the

volumes per lb. of dry air at equal pressures and the two temperatures given. Thus, the ratio of volumes per lb. of mixture may be expressed 1 : .88, for the two mixture temperatures of 1.5° and 55° F. respectively. Therefore an engine can aspirate only .88 the amount by weight of 55° F. mixture as can be aspirated of the 1.5° F. mixture. In fact, the loss in weight of charge will be greater than is here indicated, since the efficiency of the pumping strokes will vary with the density of the fluid.

The power of an engine varies as the weight of charge burned per power stroke, therefore the power delivery will be greater with a lower mixture temperature. Although it is neither desirable nor necessary to aspirate mixture at a temperature of 1.5° F. , the above serves to indicate the importance of maintaining the lowest reasonable temperature.

Initial and Final Temperatures.

An initial temperature of 60° F. will be sufficient for vaporization if the nozzle delivers a true spray. This will give a final mixture temperature which is considerably below the freezing point of water, and will thus cause a drying of the air through a condensation of the water vapor present. With perfect spraying and initial temperatures at 60° F. , vaporization is still far from instantaneous, and cannot be completed within the carburetor itself.

A temperature as low as 32° F. would not be attained by the mixture within the carburetor and lower manifold, but would begin to be approximated only toward the upper parts of the manifold. The heat conducted from the cylinders by the passage walls is sufficient to obviate a mixture temperature of 32° F. even during the latter part of the vaporization, which takes place quite close to the cylinders. With initial temperatures at 60° , a temperature of 34.5° F. has been observed in a perfectly vaporized mixture just before its entrance to the valve pocket. This seems to show that the heat of the manifold walls entered into the action toward its latter part, and prevented freezing of water vapor while at the same time assisting vaporization. The engine was running at about 950 feet per minute piston speed at full load.

The lowest initial temperatures are determined by the fineness of fuel division, which is determined by several conditions, as mentioned above. If the division is imperfect, a greater heat supply will be needed in order that the vaporization may be complete within the limited time available; but the greater the heat supply, the hotter will be the mixture and the greater the power losses.

In the vaporization of fuel in spraying carburetors it is often found that no air temperature up to 120° F. is efficacious in bringing about complete vaporization within the allowable time. In cases of this sort a change increasing the fineness of the nozzle delivery has always resulted in a more complete vaporization, and where the fineness of delivery has been progressively increased to a possible maximum value it has been found feasible to form a mixture, throughout the speed and power ranges, of perfectly vaporized gasoline and air with an initial temperature of 58° F.

In a typical spraying carburetor the method of application for best results will depend upon the character of the fuel spray, upon the constriction of the mixing chamber, and the form of the manifold passages. If the division at the nozzle is fairly fine, the application of additional heat as an increased initial air temperature will, in general, be of the greater value. This is more particularly true if the carburetor and manifold passages are free from bends. If the passages are tortuous, a heating of the walls will assist vaporization with a less expenditure of heat, and will give an equally good mixture with a lower resultant temperature than will a heated air supply. If the nozzle delivery is very poor as regards division, heated walls will serve best.

The whole question as to which of the two methods is best for any specific case resolves itself into another question—with what is the liquid chiefly in contact after it leaves the nozzle? If the nozzle so divides it that it remains chiefly entrained in

the air column, a heating of the air will give the best results; if the division is coarse, the liquid will be spread over the walls, and a heating of the walls will then be the better method, subject to the same condition of proper temperature maintenance. In conclusion on this matter of vaporization, it must be emphatically repeated that the extent to which fuel division is carried at the nozzle determines the temperature at which the mixture can be formed, and also its character referred to the degree of fuel vaporization and homogeneity.

Viscosity Lowered by Temperature Increase.

The foregoing considerations of temperature and heating effects apply solely to the matter of vaporization of the fuel. However, there is one direction in which temperature assumes a great importance as affecting mixture proportions, i.e., variations in the temperature of the liquid fuel within the nozzle. Gasoline is commonly thought of as having a very low viscosity. This is true, but the viscosity of gasoline is lowered quite rapidly with temperature increases. The comparative weights of gasoline of .71 sp. gr. flowing through the same passage and under the same pressure difference, with variations in temperature, are given in the following:

Temperature °F.....	50°	59°	68°	77°	86°	95°
Weight in unit time.....	1	1.073	1.145	1.212	1.27	1.335

With the fuels of higher specific gravity the increase in

quantity with increase in temperature assuredly is higher.

The above change in the weight discharged with change in temperature throws some light upon the tendency of carbureters supplied with heated air from a chamber about the exhaust manifold to "lose" their adjustment. With heated air supplied in this way, it has been repeatedly observed that the temperature of the air entering the carbureter will vary as much as 30° F. under changing conditions of running, the surrounding atmospheric air being at between 70° and 75° F.

Since in most carbureters the greater portion of the nozzle is so placed as to be directly in this heated air column, it stands to reason that the temperature of the nozzle walls, and consequently that of the fuel flowing through, will follow that of the air with a difference of but a very few degrees. If a constant initial air temperature could be maintained through the main air port, it would make no difference what temperature was employed; but with the exhaust manifold as the source of heat, is a practical impossibility, since its own temperature will vary from 300° to over 1,000° F.

Of course, the velocity of the air through the heating chamber will vary so that the higher velocities will be simultaneous with the higher temperatures, and this will tend toward constancy of temperature, but the relationship of the velocity to the temperature cannot be made such that a given temperature will be maintained to within more than 10° or 15° F.

THE BATTLE OF THE BEARINGS IS STILL IN PROGRESS

By CHARLES E. DURYEA, TECHNICAL EXPERT, A. M. C. M. A.

EVER since wheels were invented the problem of how to overcome the friction effects has been before the world's mechanics. Automobile makers have not been limited by the cost, so have been free to equip their vehicles with the best devices possible to secure, and have been certain that among America's wealthy buyers would be found customers for whom the best was none too good. This has resulted in a variety of arrangements of bearings as well as of kinds not ordinarily found in any single piece of machinery.

While for years there have been users of roller and ball bearings, not until the last two years has the problem come before the public in large form. The introduction of a type of bearing known as the annular, which is nothing more than the simplest possible form made up in a most superior manner, set a new mark for auto makers and called their attention to ball bearings quite forcibly. These annular bearings have been fitted to every possible part of the vehicle from the small accessories such as the pump, fan, or magneto, to the most essential parts, such as the wheels, transmission, and even the motor.

Because like begets like, this use of anti-friction bearings has spurred the makers of roller bearings and of the older adjustable types of ball bearings to renewed activity and borne fruit of great value to motor vehicle users generally.

Many people have doubtless wondered why the ball bearing unknown practically before the advent of the bicycle, has become so common and is admittedly so good at the present time; with a variety of forms of roller bearings competing for supremacy. The explanation is simple. Both ball and roller bearings must be well made to be long lived, and it has not been many decades since factories were fitted to turn out such work at prices within reach of the buyers, so the motor vehicle has caused a great forward step in mechanical progress by demanding the best and commanding prices sufficient to permit makers supplying the demand.

If one ball or roller is slightly irregular or slightly larger than the others, it must take all the strain and not only receive damage itself but very likely damage the surfaces on which it rolls. This is why such bearings are all right if they are right, and are all wrong if every part thereof is not right. This is why occasional failure results, and why only the most exceeding care

in manufacture and in assembling is necessary if the desired results are to be obtained.

Admitting this perfect workmanship, the question still remains as to which is the better ball or roller, and whether these are to be preferred to the older form of plain, bronze or babbitt bearings, with which the world is better acquainted. On this point designers differ, and each is guided in his selection by the nature of his service, by the conditions surrounding the bearing, by the probable care or lack of care it will receive, the ease or difficulty of lubrication, and largely by the speed of the moving part. In general, bearings designed for high speed and free from shock are of the ball variety, while bearings intended for heavy loads and lower speeds are more usually fitted with rollers, leaving the plain bearings for places where the strain is intermittent or in the nature of shocks such as are received by the bearings of an internal combustion engine. That practices are far from universal in following this procedure is shown by the use of roller bearings to all wheels by the Acme, Glide, Stoddard-Dayton and some of the Lambert models, while ball bearings are used by the American, the Austin-Brush, Chadwick, De Luxe, Gaeth, Gearless, Moon, National, Pennsylvania, Premier, and some others. Other designers have balls at one place and rollers at another, and like the American Simplex and the Marmon, have rollers to the front wheel bearings, and balls to the rear, or like the Mitchell, the Moline, the Olympic and the Regal, have balls to the front and rollers in the rear. In general, the use of roller bearings seems to be increasing, although the users of ball bearings have lost no enthusiasm, and their use is rapidly extending particularly to the smaller parts, where space and weight is of some importance. The fact that the roller gets a line of contact instead of a point renders it more able to carry a heavy load, and thus accounts for a preference in the certain places. The tendency toward the use of ball bearings on the motor shafts seems not to be increasing, although the new Holsman motor employs balls throughout. Unquestionably, the anti-friction bearing will do in future a still larger part of the world's work, particularly at the wheels and axles where loss of power is important and where a saving means greatly reduced gasoline bills. This is a question that must in the long run receive more attention than it has been accorded.

LETTERS INTERESTING AND INSTRUCTIVE

TROUBLE IN STARTING AN OLD-TIMER.

Editor THE AUTOMOBILE:

[1,692.]—Can you help me out through "Letters Interesting and Instructive"? I have a Franklin four-cylinder air-cooled car of the 1904 model, the motor having automatic intake valves. I am having a great deal of trouble with my car lately, finding it impossible to start without priming the cylinders, although it is easy enough to start once the motor is warm. If allowed to cool off, there is always the same trouble in starting. When after slowing down for a street crossing, the throttle is opened up again, the motor seems to choke and sometimes I have to drop from high in order to give the motor a chance to pick up again. I have just ground the exhaust valves and everything seems O. K. I have a good 8-volt, 25-ampere-hour storage battery, fully charged, and cannot understand why the machine should act in this manner. Do you think putting on a Schebler carbureter would overcome the trouble?

Any information that you can give me on this through "The Automobile" will be appreciated.

CHARLES B. FRANKS.

Corona, N. Y.

It is nothing unusual to have more or less difficulty in starting any car in cold weather, and priming is commonly resorted to, so that your trouble in this respect would not appear to be particularly serious. The "choking" you speak of is due to a derangement of the mixture by the sudden opening of the throttle and is caused by the failure of the auxiliary air valve to work promptly, as a rule, though some other lack of adjustment may also be responsible in your case. The result is that the mixture is flooded with gasoline before the extra air supply becomes effective. Carbureters have been improved to such an extent since the car you have was built that we should think the purchase of an up-to-date type would be a good investment.

WHO HOLDS THE TRANSCONTINENTAL RECORD?

Editor THE AUTOMOBILE:

[1,693.]—Will you please advise me in "Letters Interesting and Instructive" who holds the record from New York to San Francisco and return, also the time. Is the New York "Times" to hold such a race next Fall, and, if so, by what route?

W. C. M.

Poughkeepsie, N. Y.

The only round trip from coast to coast of which there is any record was made by Megargel and Fassett in a two-cylinder 16-horsepower Reo and consumed 285 days from New York to Portland, Ore., to San Francisco and back. No attempt at speed was made. The best time across the continent from San Francisco to New York was made by L. L. Whitman and C. S. Carris in a six-cylinder 30-horsepower Franklin. By running night and day, they made it in 15 days, 2 hours, 10 minutes, and would have bettered this but for an accident. Under touring conditions and carrying a party of seven people, J. M. Murdock crossed in a Packard "Thirty" last Spring in 32 days, 5 hours, 25 minutes. The Thomas "Flyer" in the Paris-New York race made the trip in mid-Winter in 42 days, 2 hours, 5 minutes, to San Francisco, the Murdock record being from Los Angeles.

The New York *Times* has proposed a race to San Francisco and return, but at the present writing the matter is not in such a state that any definite information can be given concerning it.

CARS WITH A LEFT-HAND CONTROL.

Editor THE AUTOMOBILE:

[1,694.]—In your December 10 issue you speak of a number of factories which will place the control on the left of their cars. Will you please give me the names of these makers, as I am very anxious to have their catalogues?

J. T. TUNIS.

Lexington, Ky.

At the present writing, so far as we know, the only cars that will be distinguished in this manner during the coming season will be the Ford, Babcock electric, and the Atlas taxicab. The last named refers to a number of these cabs that have been ordered by a New York company for use in the metropolis, and we are not certain that this will be the regular equipment of these cars for cab use.

SOME DATA FOR A TWO-CYCLE DESIGN.

Editor THE AUTOMOBILE:

[1,695.]—Will you kindly give me your advice concerning a two-cycle, four-cylinder engine I am building. Would a two or three-port type be best suited for slow speed work? How would make-and-break ignition do for this style of motor? What make of carbureter would you advise? What size for 2 1/2 by 2 3/4-inch motor? What weight of flywheel would be advisable for a motor for this size having four cylinders.

W. B. WATERMAN.

San Diego, Cal.

The three-port type of two-cycle engine is generally considered more simple and reliable than the two-port, though the latter gives very little trouble on slow-speed work, particularly where the load is at all steady. There is no reason why make-and-break ignition should not be as efficient on such a motor as it is on a four-cycle motor. There are so very many different makes of carbureters on the market which the manufacturers list as specially adapted to the two-cycle engine that it is almost impossible to select any one as being the best. Consult the maker whose carbureter you decide to invest in regarding the size. Half-inch would be ample for such a small motor. The weight of the flywheel will depend entirely upon the diameter you intend to make the wheel. If this is to be 16 to 18 inches, 30 pounds, as much of which should be in the rim as possible, would be sufficient.

A BAD CASE OF CARBURETER POPPING.

Editor THE AUTOMOBILE:

[1,696.]—Will you please answer, either by letter or through your next issue of "The Automobile," the following query, as I am sure that any of your subscribers who are owners of the Pope-Hartford 1905 machine have had and are now having the same trouble that I am.

After cranking my machine it will run nicely and continue to do so until I apply the throttle, whether the machine is moving or standing still, it will begin to explode at the air hole of the carbureter and will eventually get so that I have to release the throttle or the entire machine will stop. However, I can run along just as long as I use the sparker (and not the throttle). Of course, I believe my trouble is caused by the engine getting hot, but what is causing that and what is causing the carbureter to, as it were, spit back through the air tube?

I have just attached a new oiler, which is working nicely, am now using the same carbureter that the Maxwell cars have, have put new hose onto the pump, etc., and the circulation of water seems to be perfect. I have at times fed so much gasoline (in the hopes that that was my trouble) that the smoke is perfectly black.

The machine got this way about a year ago and I never could find out the trouble, and I have written the Pope-Hartford people and they don't seem to know the cause. I wish to add that I have just attached a new radiator.

WALTER M. DUNLAP.

Rock Hill, S. C.

This is what is commonly known as "popping" at the carbureter, and it is usually caused by improper carbureter adjustment, as seems to be the case with your car. The motor runs well at a certain speed simply because the present carbureter adjustment happens to furnish a mixture that is approximately correct for that speed, but the moment the throttle is opened, the proportions of air and gas in the mixture are thrown entirely out of balance. The result in your case is probably an over-rich mixture, which is accordingly heavily charged with gasoline vapor and is slow burning, so that it is still afire—or, more properly speaking, considerable of the pressure created by the explosion still exists in the combustion chamber when the inlet valve opens to admit a new charge. The pressure naturally escapes through the inlet valve, and as its only outlet is the air port of the carbureter, it rushes out there with a pop. It will be evident that sudden and sharp drafts of this nature through the carbureter in a reverse direction will upset its functioning altogether, and either cause the motor to run very erratically owing to the intermittent and improper supply of fuel, or to stop altogether. Neither the water circulation nor the lubrication would appear to have any bearing whatever on your trouble, which presents nothing more than the usual symptoms.

If there be any question of the carbureter being deranged in any way, dismount it, clean the various parts and reassemble carefully. Open the nozzle valve sufficient to enable you to start the motor, and then very gradually close it until the motor will no longer run regularly upon the supply thus allowed. Reopen again very gradually until the gasoline supply is such that the motor will run constantly. By very gradually in this case is meant merely a fraction of a turn at a time as it is easy to pass by the point of proper adjustment. This will give you as nearly perfect a mixture for slow speed as can be obtained under service conditions. Should the very lowest point at which the motor will run without missing, cause hard starting, it is well to open the nozzle a bit further. Having reached this point, the auxiliary air valve should be adjusted to provide the proper mixture at the higher ranges of speed. Open the throttle slowly and note whether the motor "follows," i.e., speeds up regularly and without missing in proportion to the increasing throttle opening. If the spluttering and popping occurs, accompanied by black smoke, release the tension of the spring somewhat so that more air will be drawn in; if the reverse be the case, the motor missing, due to a thin mixture, tighten the spring. The overheating you complain of and which you seem to have gone to a great deal of trouble to correct has probably been due to the constant use of an overrich mixture, which may or may not have been aggravated still further by running with the spark more or less retarded.

FAULTY TIMING PROBABLY THE CAUSE.

Editor THE AUTOMOBILE:

[1,697.]—I have a two-cylinder Ford, 1904 model, the engine of which does not give the power it should, so I would like to see if you can help me out of my difficulties through "Letters Interesting and Instructive." The engine seems to drag and lose power. It will not climb grades on the high and overheats so that it pounds very badly. Do you think the valve timing or the ignition is at fault? How can they be timed correctly? If this is not the probable trouble, what other causes and remedies would you suggest? How can I rebabbit a connecting rod bearing? I would like to make the repair myself, but am at a loss to know how to do it. Have there been any articles on the timing of valves and ignition in "The Automobile" during 1908? If so, in what issues did they appear?

East Orange, N. J.

PERPLEXED.

It seems more than probable that the trouble with your motor is caused entirely by faulty valve and ignition timing due to wear. Cams, push rods and tappets all wear more or less in constant service, and this is likewise true of camshaft bearings, so that in the aggregate a slight amount on each would be responsible for a very perceptible difference in the valve timing, which would naturally tend to become later and later. This, in the case of the exhaust valve, would account for the overheating as the waste gases would be retained in the cylinder that much longer, and it would also account for the lost power as the inlet would open much later, preventing the inspiration of a full charge, this also being defeated by the high temperature of the motor.

Before attempting to readjust the timing, examine the camshaft bearings and if they allow sufficient play to have any influence on the valve opening, renew them first. The cams should also be looked to, and as they are undoubtedly pinned to the shaft, they may be replaced if found to be worn badly. Wear on the push rods and valve stems may probably be compensated for by adding slightly to the length of the latter, if necessary.

If the builder of the car has provided a guide on the flywheel for timing the motor, this had better be followed. If not a good timing for such would be about as follows: Open inlet valve 5 degrees past upper dead center, hold open 15 degrees past lower dead center; open exhaust valve, 25 degrees before reaching lower dead center, setting it to close at upper dead center or slightly beyond. This is on the assumption that the motor is designed to run at 800 to 1,000 r.p.m., which is probably the case as the horizontal twin-cylinder motor is not usually a high-speed type. The degrees are measured on the flywheel rim. Ignition should occur about 20 degrees in advance of reaching

upper dead center on the firing stroke, assuming that coils and batteries are employed. The timer should be carefully inspected and made good; probably by replacing it with a modern type.

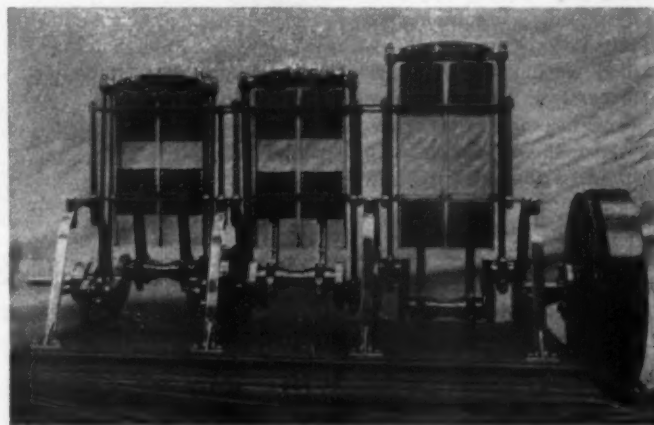
The proper method of timing the valves and ignition of a motor have been described several times under this heading, and a special article on the subject will be found in the issues of October 29 and November 5, 1908.

To rebabbit the bearing, line up the parts in exactly the relation they should bear to one another when working, after having thoroughly cleaned them. The bearing should rest on a block of wood so as to clear the bench all round. Take stiff putty and build a dam to close one end of the bearing, making allowance for the formation of a shoulder when the metal is poured. Make a similar dam at the other end forming a spout at the upper side in which to pour the metal and this spout should be made an inch or two higher than the level of the bearing. Use a high-grade babbit, bring it almost to a red heat, skim off the dross and pour quickly.

AGAIN THE GOBRON BRILLIE MOTOR.

Editor THE AUTOMOBILE:

[1,698.]—In your issue of November 26 you inform one reader, in letter No. 1,651, and show in a little design what is called a section of the double piston idea of the Gobron motor. This information is



Illustrating the Gobron Motor of 1908.

incorrect. The sketch shows the piston idea of the Boudeaux-Verdet motor with differential pistons, while the Gobron system is one of the opposite pistons type. I include a motor photo with glass cylinders, which was exhibited in the Paris Salon, 1907, and it will show the idea in a quite satisfactory manner.

EDITOR "ALLGEMEINE AUTOMOBIL-ZEITUNG."

Berlin, Germany.

LOOK OUT FOR THE SMOOTH-FACED STRANGER.

Editor THE AUTOMOBILE:

[1,699.]—A very good deed which you could do would be to notify your readers warning them against a gentlemanly-appearing crook who drives a 1907 Pope-Toledo touring car. He is a dark-complexioned chap, with smooth face. He stops autoists and pretends to be in trouble, then borrows something in the tool or tire line. I was charitably inclined and loaned him an inner tube. He gave me a fake name and address—the latter was a church in Brooklyn. This same gentleman has also "bitten" others. He operates mostly around the parks.

New York City.

FRANK ALDEN MILLER.

A NEW RECORD WORTH EMULATING.

Editor THE AUTOMOBILE:

[1,700.]—I wish to record something different. Last Monday, when all the horses in Buffalo were suffering from the effects of a snow fall, a "friend in need" pulled one of them and his heavy load (the horse had been stalled) with an automobile, and I guess delivered the goods. I didn't see the end of the haul.

The friend was George Ulrich, who will be remembered as Mechanic No. 2 in the first Glidden tour. He went through the "flood" with Percy Pierce and the Pierce Stanhope. He is a good fellow, as everybody knows connected with autoing. H. T. DUNKAR.
Buffalo, N. Y.

WHY THE AMERICAN MAKER NOW LEADS THE WORLD

By BENJAMIN BRISCOE, CHAIRMAN A. M. C. M. A.

ONE significant feature in connection with the rapid growth of the American automobile industry is a corresponding decrease in the business of the European manufacturer, who until only a short time ago had to be considered America's most formidable rival. As a matter of fact, the French manufacturer has to make preparations to defend his own market from the threatening invasion of the American product.

Even the most ardent desire to pay tribute to the ingenuity of the foreign manufacturer cannot remain blind to the evidence that the American manufacturer has recognized the various problems and possibilities presented by the new conveyance and taken care of them with greater alacrity. It is true that the automobile designer, particularly the foreign one, is prone to follow his engineering ideal to the detriment of the utilitarian side of the question. The American manufacturer, on the other hand—and this is perhaps an attitude characteristic of the American spirit exemplified in other fields—early came to the conclusion to cater to public demand as soon as such demand would assume definite shape. The result of this policy was the low-priced and economically-maintained car.

The American automobile is a nearly perfect car, and this result was attained not only by the use of good material and skilled workmanship, but principally by providing interchangeable parts, so that it is possible to produce units in great numbers with a single setting of machinery during the entire season. In short, the difference in foreign and American manufacturers' methods is that existing between making automobiles and manu-

facturing them. In the American method everything is interchangeable and in the foreign method it usually is not. It is a well-known fact that has been established to the edification of a New York taxicab concern that it is rarely possible in the French product to take the motor out of one chassis and place it without difficulty and without drilling new holes in the frame of another car. The two principal reasons for the superiority of the American product consists in low price and interchangeability of parts—the one produced by the other. The third factor is the reliability of the American car, and an additional element the much greater field in this country upon which the automobile can show its usefulness.

While the foreign manufacturer suffers from the evils of over-production the more important American makers find themselves in the other extreme, being generally oversold at a time when the yearly production is barely under way. Much of the present popularity of the American motor car is due to standardization and to a condition in which rapid changes are no longer the rule, but the exception.

It may not be too much to say that the precedents established by foreign makers and the ability of the American engineer to avoid the mistakes of his precursors has had much to do with our present advantageous position and our command of the world's automobile market.

That the American market will control the world's automobile demand there is no doubt, and the opportunities for such control are only beginning to manifest themselves.

THE SUPERIOR SPRINGING IN THE CARS OF TO-DAY

By CHARLES E. DURYEA, TECHNICAL EXPERT, A. M. C. M. A.

THE old adage that "details make perfection," is each year being given new life by many details of automobile construction, and in no one of these may it be seen more clearly than in the springing of the present day which will be exhibited at the Grand Central Palace automobile show, the first week in January.

The springs of horse vehicles were the product of a century of growth and development, from the time when the massive coach bodies were hung from four posts by leather straps so that they could sway in almost any direction and thus avoid the jolting of the wheels over the uneven roads of those days. From such crude hanging to the light, flexible and easy riding springs of the modern buggy was indeed a long step, requiring many years of trial and failure, till proper proportions, proper steels, and proper mountings were secured.

The motor vehicle developed a new problem. The earlier makers found it almost necessary to carry the mechanism above the springs in order to protect its many fragile parts from the road vibration, and this necessitated transmitting the power to the driving wheels through some flexible connection such as chains, or universal jointed shafts. Naturally, the makers sought to lessen their trouble by employing springs of minimum elasticity and greatest strength in order that they might the more safely carry the heavy and crude mechanism. As a result of this policy, the earlier motor vehicles were notoriously stiffly sprung and uncomfortable to ride in.

The last year or two has brought about great changes in these respects. Propeller shafts and their universal joints have been lengthened and improved until they are no longer regarded as sources of trouble, and until they permit large amplitude of spring movement both vertically and sidewise, much as does the spring under the usual horse vehicle. While few riders stop to think of the effect of this rolling or sidewise movement of the body, it is none the less true that the vehicle in which

this movement is permitted rides more easily and is not affected by any qualities at one side of the road or the other, as is a vehicle less flexible in this direction.

The mechanism itself employed in modern autos has been designed to withstand or to permit greater wheel movement and greater spring action than was true in the earlier construction, so that springs to-day show not only greater elasticity but a greater variety of forms. Steel makers are doing their part by providing steels of better quality, especially adapted to the severe service of automobile work.

A few years ago the semi-elliptic spring fastened to the axle at its centers and to the body at its ends, was the common and almost generally accepted form. This spring permitted a vertical movement, but was practically rigid sidewise, and so served well to hold the axles in line with the mechanism and thus enable chains to follow the sprockets and transmit power in a satisfactory manner.

The full elliptic spring, a most common form on horse vehicles, was not considered so satisfactory in auto work, because it had less sidewise rigidity, while platform springs, the most flexible of all, were not to be thought of.

This year will show a much larger variety as exemplified by full elliptics on the Reo, Regal, Premier, Pennsylvania, Oakland, Mora, Moon, Moline, McIntyre, Maxwell, Marmon, Jackson, Holsman, and others, while some models of these same makers will show semi-elliptic, as will the Acme, the American, the Austin, Chadwick, DeLuxe, Ford, Gaeth, Gearless, Glide, Mitchell, and others.

Three-quarter elliptics will be found on the Reo, Pennsylvania, Premier, and Austin.

Platform springs are used on the Stoddard-Dayton, one model of the Pennsylvania, Moon, National, and American. In a few instances double springing is used consisting of one spring within another, whereby one takes the lighter load.

The Finest Automobile Ride in the World

THE title is true. There are just 14 miles of it, but those 14 miles yield more interest and more indelible impressions than any other 14 miles of road extant. This is the St. Gothard Pass, in the Alps.

It forms a part of the most direct route between Como and Lake Lucerne. It crosses the mountain range whose name it bears and whose highest peak, the famous Galenstock, rises nearly thirteen thousand feet. The pass itself reaches an altitude of 10,000 feet, being anywhere from one to four thousand feet higher than the more recently constructed railroad pass and tunnel underneath.

Such geographical specifications seemingly would insure the pass of St. Gothard to be a famous and well-patronized automobile highway. The contrary is true. The average automobilist, whether home-spun European or imported American, avoids the pass of St. Gothard. It is a road for the daring, and its charms, that are visible from every turn of the road, are well worth the venture.

We were touring Europe in our Packard "Thirty" when we came to the pass. Its grandeur and its difficulties were recounted to us. We decided in favor of the grandeur, and learned that touring Europe in an auto is one thing of which a ride through St. Gothard Pass is not a part, but another and bigger thing.

At the entrance is Airolo, a typical cluster of chalets, plus hospice and railroad station. We reached there late in the afternoon and learned that automobiles may venture on St. Gothard Pass only in the evening and early morning. To be exact, they are allowed on the pass between 5 and 7 P.M., and 6 and 8 A.M. The better part of the permitted two hours is required to make the journey.

We went that evening. With a strange apprehension that was almost timidity we looked up from beautiful Airolo into the snow-coated mountain peaks that hid all but the first few turns of the wonderful pass. Then we started from summer into winter; from a temperature of 82 degrees to a temperature of 10 degrees; from pleasant, comfortable touring into difficult, uncertain, and dangerous mountain scaling; from a prettily set village into stern heights where mere prettiness would be an insult to the view's magnificent



Occasionally St. Gothard Pass Twists Through a Beautiful Mountain Village.

portions indescriptive in words.

When this pass was built for the moving of armies, no other purpose was taken into consideration. Seldom is it wide enough to allow the safe passage of two vehicles. In many places, one vehicle has a narrow and precarious footing on the mountainside. For miles it is possible to look over the side of the car, down perpendicular rock walls, to snakelike torrents of melted snow a thousand or two thousand feet below. There is no wall on the outer edge of the pass, the greatest precaution for safety being a slight curb, five or six inches high. Sometimes the road slants downwardly toward the outside.

The prompt ascent after passing the guard house necessitates learning a new kind of automobile driving. The steep grade is a succession of sharp, narrow turns. Some of these angles were so acute that it was impos-

sible to turn them without stopping and backing the car. As we progressed, we learned to negotiate these turns somewhat more easily by swinging just at the right point and just inside of a corner where the pass ended and a vertical precipice began. All the time it was steady, hard climbing on second speed. The motor settled down to an unquivering gait, and there was no break in the even progress except an occasional acceleration at the acute turns where it was necessary to increase speed in order to make them without shifting gears.

We were awed by the dangerous character of the road; by the natural respect which the mountains themselves commanded, and by the occasional glimpse of the ubiquitous Swiss bayonet, thrust over a stone wall or a pile of rocks. In St. Gothard Pass you are always between two evils. You must not stay in the pass more than your allotted two hours and you must not exceed certain speeds to get out of it in that time. However, you are not angry at restrictions. The road is dangerous enough when you are the only traveler on it. It is no place for meeting other automobiles. "Joy riders" should not come here.

The man behind the bayonet never speaks and you do not answer. Sign language is sufficient. We, in the climbing car, did not even talk to one another. There are some places where conversation is profanation. This is one of the places.



Devil's Bridge That Spans a Mountain Stream.



Where St. Gothard Pass Becomes a Pitch Black Tunnel.

The echoing blast of an Alpine horn put us in a quiver. It meant the approach of a skidding stage coach descending with wheels locked. We took no chances in passing vehicles on that road. Fortunately, there is little other traffic than the mail coaches, a few local carts traveling short distances and, in the lower altitudes, herds of sheep.

Once we shot down a sharp and unexpected decline to find ourselves headed for a small black hole in the face of an immense expanse of rock. There was just room to steer the car into it clear of the walls. Daylight was snapped out in the infinite blackness. We were scared, but we did not light the lamps. For what seemed a day, and probably was a quarter of an hour, we drove through this winding tunnel, guided only by the reverberation of the trilling motor against the rock.

When at last we left the streak of night, we found the winding shelf illumined by the mellow lights of evening. Again we climbed, climbed and climbed up the mountain wall. It was cold and we huddled together in the car.

We ran through snow, blown in icy sheets against our faces. Looking upward, the pass was faintly and more faintly marked at each successive turn it took along the mountain. It seemed an unending journey to the peak above, and when that goal was reached, we saw again the zigzag pathway to the next.

The wonderful background of lurid fires where the sun sank behind the glistening snow caps; the devious road disappearing in the subdued colors of cloud-toned twilight; the great solitude—all of it was awesome, fascinating, overwhelming.

Tensely silent, we rode to the highest point. There the strain was broken by the marvelous beauty of the panorama spread at our feet. We stopped and clambered out of the car for a last look over the valleys and peaks, snow drifts and glaciers, rivers



Here the Pass Is Between Pastoral Scenes and Peaks.



Where the New Railway Is Visible from St. Gothard.

and villages, passes and tunnels of this Alpine region as pictured from the turrets of Galenstock.

For an hour we had not spoken. We were chilled to the bone. There had been no sound except the ceaseless purring of the motor. Our farewell glance upon the scene was a lingering one. The winding four-mile descent to Andermat was begun reluctantly. Once on the way, however, we slid and scrambled down that shelf as fast as we could without going over its side. That was the hardest job of steering I ever have done. It was a case of 100 per cent. accuracy, because there was no allowance at any place along the twisting road for the mistake of an inch.

Afterward, we continued our tour through Europe (some 6,000 miles altogether) but that, to me, is always another story. Whenever I think of those 14 miles on St. Gothard Pass, I immediately forget all of the other automobiling which I have done in deep appreciation of the wonders of this finest of all automobile rides there are in the whole wide world.

PARIS TO HAVE MOTOR-DRIVEN FIRE BRIGADE.

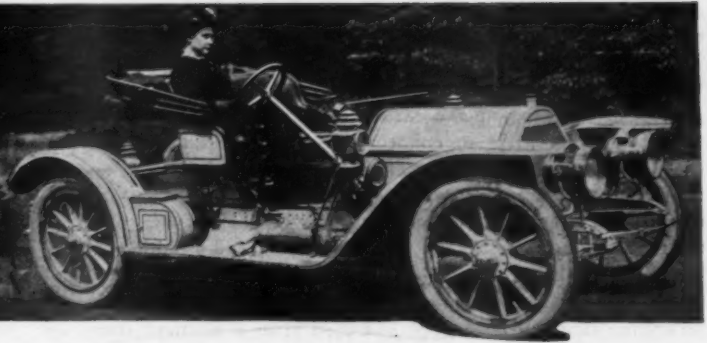
PARIS, Dec. 17.—All horses have to be dismissed from the city of Paris fire brigade and their places taken by gasoline motors. The order has been given by the Municipal Council after two years' close experimenting with mechanically driven engines and fire tenders and would be put into force immediately were it not for the heavy cost. There are at present 76 horse-drawn fire engines in the city of Paris, costing annually a sum of \$64,000; if they could all be immediately transformed into gasoline engines the annual upkeep cost to the city would not exceed \$17,400. The cost of transformation, about \$320,000, will be spread over a period of six years.



The Hospice at the Terminal of the St. Gothard Pass.

When Woman Takes the Wheel

Miss Anna H. H. H.



WHY don't more women drive automobiles? There are, to be sure, a great many women who drive cars as skillfully and successfully as any male driver, and it is an interesting and noteworthy fact that each season there is a considerable increase in the number of women who become owners and operators of motor-driven vehicles. A few years ago a woman driving a car unattended attracted much attention and was viewed with undisguised curiosity by all who saw her. There was only now and then a woman who had the temerity to make an attempt to operate an auto, and, indeed, when one considers the imperfections of the car built a few years ago, one can more readily appreciate the many obstacles that she had to contend with and overcome if she became a successful driver. Cars were then far more complicated, mechanically, than any at present, but even so it was fully demonstrated that there were some women who possessed the ability to overcome these obstacles, and who—probably possessing a tendency toward things mechanical—mastered the intricacies of the gasoline engine and succeeded admirably as operators.

Before leaving home for a trip the car should be care-modern conveyance have a strong desire to operate it herself—there may be several reasons for her not doing so. Nine out of ten women who are asked why they don't drive their own car, invariably answer in the same way—that they are too nervous. This is no doubt perfectly true in many cases where it would certainly be unsafe for a woman afflicted with "nerves" to attempt to handle a car. Still, the trouble of nervousness is greatly exaggerated by many women, and would undoubtedly in most cases rapidly wear away as confidence in herself became established.

Then there are the women whose husbands do not approve of the feminine portion of the family aspiring to the honor of driving the family car. His real reason is without doubt in many cases a wholly selfish one—he fears her proficiency and does not want her to use the car as often as she would wish were she capable of its operation. But in spite of the many cynical shafts of alleged wit that some "superior" men love to launch at feminine autoists, the woman who drives and understands her car has a distinct advantage over the woman who motors without enthusiasm, and who does not know the difference between the spark

plug and the rear axle or a Wray muffler from the device which silences, and there are very many motorists of this type.

Then there is the motor woman who dislikes machinery—who is afraid of soiling her hands or gloves or gown with a bit of oil or grease, and who considers herself of far greater importance and far more elegant when

seated like an automaton in the tonneau of the car dressed as elaborately as the pastime will possibly permit, with a miniature powder puff always ready to dab her nose occasionally for fear a little dust may settle thereon.

But the time has come when the ambition of the woman autoist is to be able intelligently to understand the mechanical features of her car and to learn to drive well that she may go about when and where she wishes without being bothered with a professional chauffeur. There are very many women who might enjoy the pleasures and benefits of autoing were it not that they doubt their ability to learn how to drive and how to overcome obstacles. The majority of these same women would be perfectly able to master the modern car after some practical instructions from an expert.

A great many women who could easily manage their car hesitate to do so through mistaken ideas of the difficulties to be overcome. The very first thing necessary for the woman who has decided to become an owner and driver is to select her car. If she is wise she will pick one which is simple in construction, for this is an important factor when she is to drive the car herself. Of course, a car of standard manufacture is always preferable to one little known, and a moderately powered car will answer her requirements perfectly. The first duty after purchasing the car is to become perfectly familiar with it, for the greatest pleasure of autoing is to be able to do all things about the car that exigency may demand.

The first time the woman operates her car alone she will have very little confidence in her own ability. It is always wise to practice turning—backing about and turning around—plenty of room as free from obstruction as possible should be found to experiment in.

One should learn to control the speed of the car with spark and throttle as much as possible and only release the clutch when absolutely necessary. The low gear should only be resorted to in extreme cases. The spark should be used for speed and the throttle for power. Gradually familiarizing oneself with the operation of the car, the disengaging of a clutch or applying of a brake will become practically automatic.

Before leaving home for a trip the car should be carefully looked-over—this will occupy but a few minutes

and save much annoyance from troubles on the road. The batteries and coil should be tested, the spark plugs clean, the gasoline and water tanks well filled, and there should be a plentiful supply of lubricating oil. An abundance of oil should always be kept in the crankcase of the engine, the change gear box and the rear axle or differential. Each and every wearing part—the



axle joints, steering gear, change gear levers, brake mechanism, etc., should be liberally oiled.

It is always important that the gasoline should be strained before putting it into the tank—it only requires the tiniest bit of grit or dirt to clog up the carbureter. The two most important factors to look after in connection with a gasoline engine are the flow of gasoline and the electric spark. The ignition system should be watched and gone over carefully from the batteries to spark plug. If an engine slows up the trouble is very likely in the mixture of gas supply or to the batteries running down. When the engine comes suddenly to a stop it is practically certain that the cause is some defect with the ignition system. If an engine slows up and stops and then after a moment starts up again and runs a mile or two, it is a sure sign that the batteries are run down. An engine seldom stops abruptly without preliminary warnings.

Sometimes a mixture of gas is exploded in the muffler by the heat of the exhaust. This is called back-firing and is caused by too great a supply of gas being fed to the engine. As this cannot be fired or exploded it is forced into the muffler with the exhaust gases. A sure sign of too much lubrication is blue smoke coming from the exhaust, and when too much gasoline is being consumed the smoke will be black. An over supply of either oil or gasoline will cause dirty valves and sooted plugs.

A constant buzzing of the coil denotes a short circuit. The coil should buzz only when a spark is wanted. When the coil does not buzz it is an indication of no current, caused either by weak batteries or broken wiring.

After a woman has operated her car for some time she can readily tell by the sound whether the engine is running smoothly and correctly. If there is premature ignition, loose bearings, loose distance rods, any small obstruction in the sprocket or gears, or a broken or loose framework, or, in fact, any unusual sound, it should be immediately investigated and eliminated, if possible, for although one may be able to get home the damage done is quite apt to be expensive to the owner. When the engine has become overheated and the pistons are jammed tightly by lack of water, the cylinders can be tested by sprinkling a little water on them. If the water hisses and immediately dries off the tank must not be refilled until cool. Some kerosene can be poured into the pistons while they are hot. This can, of course, be taken from the lamps. If the pistons have become seized the cooling process will be a slow and tedious one. There are symptoms, however, that indicate overheating, such as a violent pounding of the engine, steam issuing from the filling nozzle, water coming out of the overflow pipe while driving, continued

firing after the ignition is off and smoke rising from the engine. If these symptoms are noticed, and kerosene is injected into the cylinder, meanwhile turning the engine by hand, the temperature will go down and the pistons will move freely. The most effective way to cool a heated bearing is to pour water on it until cool. It should be well oiled before attempting to run the car again.

In driving it is quite unnecessary to disengage the clutch or to apply the brake when turning corners. The speed of the car should be lessened by throttling as the corner is approached and opening up when about half way around. Plenty of room should always be allowed in case of the car skidding. In climbing steep grades it is necessary to drive with the spark a little slower and throttle well opened. The engine should never be allowed to race; the moment it begins to race the spark should be retarded. An engine is at its best when run at its highest speed without racing.

A car should never be left standing alone without setting the brake and removing the switch plug. Testing the brakes every day only takes a second and is an important thing.

The woman autoist must have her car positively within control before attempting steep grades. In ascending the principal requisite is plenty of power, while in descending the brakes are an absolute necessity if danger is to be avoided. When the woman is driving she must give all her attention to her work. She cannot look around at the scenery, talk over the latest fashions with her friends or forget her responsibility, for the slightest mistake or a loss of control of the wheel may result seriously if not fatally to herself and companions.

One should at first confine themselves to short trips until they have learned to understand each and every piece of mechanism of their car and the proper function of each. On long trips it is especially necessary to thoroughly know the motor. When that is accomplished longer trips may be taken with perfect safety, especially if a little previous experience will have the effect of instilling confidence, which is an asset not to be ignored.

The woman who is learning should above all else be possessed of the virtue of patience. She cannot expect to learn to know her car at once. Perseverance and patience and time will work wonders and constant association with things mechanical gives one a degree of skill in manipulating tools that will astonish the novice. Common sense is the first principle needed to run a car. Ingenuity is another needed requisite, and with intelligence and the desire to become proficient the average woman may confidently expect to develop into a successful and expert car driver.

TENTATIVE SCHEDULE FOR EUROPE'S BIG 1909 EVENTS

PARIS, Dec. 17.—In accordance with an established custom advantage was taken of the presence of delegates to the Paris Salon to draw up a calendar for automobile events in 1909. At present the dates are only tentative, the interested parties being given until January 15 to make changes or additions. After this time all new events proposed must be on days that do not clash with the program now drawn up.

In January the only important features are the Brussels Show, held from the 16th to the 25th, and the Turin Salon, from January 30 to February 14. During February the Monaco motor boat and aeroplane races will be held; during March there will be a number of events on the Mediterranean coast, but none of them of more than local interest.

There will be a small industrial and taxicab competition in the neighborhood of Paris from April 15 to 25; motor boat races will be held on the Sicilian coast on the 25th and four days later the Sicilian voiturette race will be held.

May 2 has been selected for the Targa Florio, in Sicily.

Moscow-St. Petersburg automobile race will be held on May 26.

Germany and Sweden will both hold industrial vehicle competitions during the month, the exact dates to be decided by mutual agreement.

June 10 to 18 will see the competition for the Prince Henry Cup in Germany. Kiel regatta is fixed from June 24 to July 3 and Switzerland will hold an industrial vehicle competition on the same dates.

The French Grand Prix has been scheduled for July 1 to 3, the first day probably being for weighing-in and the two following days for the voiturette and big car races.

Ostend automobile week will take place from July 13 to 17; and from July 24 to August 2 Amiens will hold an exhibition for agricultural automobiles.

Mont Ventoux will be climbed on September 5.

Italy will have its great race under international rules at Bologna from September 11 to 19; Semmering hill, in Austria, will be climbed on September 19.

Austria will hold a commercial vehicle competition from October 3 to 17, and the Automobile Club of France will have a similar demonstration and test from November 18 to 28.

COMPLEX CHARACTERISTICS OF AUTOMOBILE BODIES

By CÔKER F. CLARKSON, A. L. A. M.

ONE of the most important branches of the complex automobile industry is undoubtedly that connected with the body. When the first gasoline machines made their appearance, the questions of comfort, appearance and durability in body work were relatively neglected. There were a few American carriage builders with sufficient foresight to perceive the trend of events, banish their prejudices and meet the demand of the automobile manufacturer and user more than half way.

Wood still plays an important part in high-class automobile body work. And if satisfaction is to be given, it is essential to employ none but carefully selected and thoroughly dried pieces.

For the making of automobile wheels on the artillery plan only the most carefully dried wood, without flaw of any description, should be considered. One firm claims that up to the present time no accident arising from a faulty wheel produced by it has been reported.

All the wood is many years old. It is stocked in buildings, ventilated by a special system, and packed layer on layer with joists between, in order that the drying process can continue evenly. The entire stock is examined every year and turned. At least five years elapse from the entry of a piece of wood into the storage, before it is cut up for use.

It is interesting to go through the various departments from the designing rooms to the varnishing hall with its even temperature, excellently arranged lights and dust-proofness.

There is nothing mysterious in good coach work, although it is surprising to find the great number of parts required to build up a limousine or laudauet, the strength of the iron-work and the tremendous number of coats of finish. The paint on a large limousine body weighs much more than the average man would say; as much as seventy-five pounds or more. The painting and trimming of the car is in material degree specialized work. Good painting cannot be done on other than a good foundation, with the proper graduation of the several coats of paint and varnish.

The strains to which a motor car body is subjected are greater than and considerably different from those in the case of a horse-drawn vehicle. No one engaged in making cabinets, furniture, house or other stationary fittings, could have any knowledge derived from the practice of his own business of what is necessary for the automobile. The framing of the timber, the use of panels, not merely as enclosures, but as trusses supporting the external framing, the hanging of the doors and provision for the clearance for paint, etc., have to be studied specially. The supposition that springs can give ease of riding when comparatively little attention has been paid to the form or material of the body and its trimmings is responsible for much discomfort.

The Mechanical Branch of the Association of Licensed Automobile Manufacturers has held meetings with representative carriage makers, to see whether the latter can reduce the weight of bodies to any extent, and to interchange ideas on other interesting subjects on which the automobile engineer and the body maker are working.

The Carriage Builders' National Association was founded thirty-five years ago, and about twenty-five years ago established a technical school in New York for the instruction of carriage draftsmen. The idea of this school is to turn out men who can take a draft and work from it; or go back to the bench as workmen, their wages being increased by their technical knowledge; or later on perhaps, secure employment as draftsmen to the exclusion of other work.

You can take two men and put them side by side in construction; let one man know his business, understanding just how the thing should be proportioned; he will turn out a body that will be stronger and better than the man at the next bench; and there will be one hundred to one hundred and fifty pounds less weight in the product of the good man.

One serious thing that the automobile and the body maker have been up against is the man who wants to have a body built that will carry one person with the springs riding easily, in which he can pile eight or ten people and have the springs ride just as easily; which is somewhat like making a linen duster and a fur coat out of the same cloth.

The makers of wood automobile bodies will not acknowledge that bodies made of aluminum are lighter than those made of wood; but maintain that the real state of facts is the reverse. By the use of templets practically, some excellent bodies are now being turned out with great rapidity.

The question of metal panels on bodies has another feature besides weight. One of the things that has troubled the carriage manufacturer is cracks and splits in the panels; which aluminum or sheet metal construction eliminates. The extreme heat and cold of a country are factors to be considered. A body built for example, in England, France, Germany or Austria, which have moist climates, different from ours, may last there for years, and give trouble here, in steam-heated garages, etc., by what is called "opening up." This is one reason why it is customary to kiln-dry lumber here, whereas abroad anything but air-dried lumber is rare or unknown. Moreover, the kind of wood generally used in this country has a lower coefficient of contraction and expansion, besides being stiffer.

Some body makers use aluminum-coated steel for panels, to avoid checking in painting and what is known among painters as "graining out."

As a rule automobile bodies are lighter than a corresponding body on a horse-drawn vehicle; for example, the rocker plate and sills of an ordinary landau, which weigh one hundred and sixty pounds, are eliminated in an automobile body.

No doubt people who have built metal automobile bodies up to the present time will in the future use increasingly, processes not dreamed of a short time ago, welding parts to make them integral, doing away with the use of rivets, screws, etc. Of course, there has already been much development in the use of cast aluminum for bodies.

The American carriage builders are now thoroughly aware of the changing character of their trade and welcome the automobile. They appreciate keenly the business of the automobile factories and are willing to work with them in every way. The members of the Licensed Association are pioneers in this co-operative work as in many others. When the automobile started, the average carriage maker pooh-poohed it, and would not take hold. In Europe no automobile maker has ever built a body, except one German firm who built a low-priced one.

MICHIGAN AS AN AUTO-MAKING STATE.

LANSING, MICH., Dec. 28.—The growth of the automobile and allied industries in Michigan during the year 1908 has been enormous, according to the records of the Secretary of State. This in spite of the fact that 1908 was one of the most unfavorable years in the industry. The records show that no less than 22 new corporations were organized for the manufacture of automobiles or motors, the conducting of garages, or the developing of the gas engine. These 22 corporations have a combined capital of \$2,400,000.

In addition to the 22 new corporations, 11 more engaged in these industries have increased their capital stock from \$2,340,000 to \$6,500,000. This makes the new incorporations and additions to capital during the past eleven months in Michigan alone aggregate nearly \$7,000,000.

These figures do not include the large organizations of the Cadillac, the Oldsmobile, Reo, Chalmers, Buick, Reliance, Brush, and some of the other important companies. The estimated dividends earned during the year will aggregate \$50,000,000.

THE AUTOMOBILE

Vol. XIX

Thursday, December 31, 1908

No. 27

THE CLASS JOURNAL COMPANY

Thirty-ninth Street Building, 231-241 West 39th St.
New York City

H. M. SWETLAND, President

EDITORIAL DEPARTMENT

A. G. BATCHELDER, Managing Editor
R. F. KELSEY, Associate Editor C. B. HAYWARD, Engineering Editor
W. F. BRADLEY, Foreign Representative

BUSINESS DEPARTMENT

A. B. SWETLAND, Business Manager

LOUIS R. SMITH FRANK B. BARNETT
W. I. RALPH, 1035 Old South Building, Boston, Mass.
C. H. GURNETT, 1200 Michigan Ave., Chicago, Ill.
F. W. VAN SICKLEN, Detroit, Mich.
H. H. GILL, Detroit, Mich.
T. B. VAN ALSTYNE, Philadelphia, Pa.

Cable Address - - - - - Autoland, New York
Long Distance Telephone - - - - - 2046 Bryant, New York

SUBSCRIPTION RATES:

United States and Mexico - - - - - One Year, \$3.00
Other Countries in Postal Union, including Canada - - - - - One Year, 5.00
To Subscribers—Do not send money by ordinary mail. Remit by Draft,
Post-Office or Express Money Order, or Register your letter.

FOREIGN SUBSCRIPTION AGENTS:

ENGLAND:—W. H. Smith & Sons, Ltd., 186 Strand, London, W. C., and all their
railroad bookstalls and agencies throughout Great Britain; also in Paris
at 248 Rue de Rivoli.
FRANCE:—L. Baudry de Saunier, offices of "Omnia," 20 Rue Duret, Avenue
de la Grande Armée, Paris.
GERMANY:—A. Seydel, Mohrenstrasse 9, Berlin.

Entered at New York, N. Y., as second-class matter.
The Automobile is a consolidation of The Automobile (monthly) and the Motor
Review (weekly), May, 1902, Dealer and Repairman (monthly), October, 1903,
and the Automobile Magazine (monthly), July, 1907.

Copies printed in 1905 - - - - - 730,000
" " in 1906 - - - - - 791,000
" " in 1907 - - - - - 888,900

THE GRAND CENTRAL PALACE SHOW

Displayed to the best advantage possible under the circumstances, the automobiles at the "Palace" are there to do justice to the promises made for them. That the exhibition would be more in keeping with ideals, would be true were the Palace quite double its actual size, but this would add nothing to the quality of the cars or the enthusiasm of the exhibitors and the spectators. There is a distinct tone of rejoicing which is steeped in confidence, and participation is general. The makers recognize the fact that they undertook much in their endeavor to make and deliver a greatly increased number of superior cars at a far lower price, and they rejoice now that the task is substantially completed. The spectators knew full well what was going on and were curious; the public is always on the lookout for an ambush. On this occasion the public are quick to recognize what will go down in history as an agreeable situation.

Makers have been promising that the 1909 automobiles would be full fledged perfected products, at the price which formerly represented the purchasing power of little better than runabout types. Generally such statements are the product of viewing things through rose

colored glasses, at a distance so far that the actual state of things would be unrecognizable. As it is, the whole situation is as simple as A, B, C. The products are actually there, they are in such profusion that choice is going to be a difficult task and the worst choice possible to make will land a better automobile than the best that double the money would buy, even one single year ago. It is not that the makers are in a mood to deliver something for nothing; they fully intend to pay dividends; the chances of succeeding are much enhanced.

What is it that crept into the automobile business that thus rendered such a condition possible? Was it because the business fell into the hands of men of more skill? Decidedly no! The whole situation is representative of the old adage, i. e., "practice makes perfect." The time was sure to arrive when automobile co-operation, involving the makers of cars and the fashioners of materials, would result in a perfected product. The countless detached and incongruous ideas were either incorporated, or cast aside, depending merely upon their abstract value. The horde of theories in relation to materials were reduced to a settled few and the process of manufacture was put on a basis involving the duplication of parts, each like the other, all in full compliance with a settled plan.

Harmony reigns supreme, and the direct result is lower prices, better cars, and assured dividends. The purchaser (the intelligent purchaser) is as much interested in the question of dividends, as in the direct question of the quality of the offering. To acquire a car from a company that is about to embrace the "receiver" is to take out a license to pay an enormous price for repair parts, and wait until they are whittled out by hand in a repair shop. This is not all. The product will soon look like an odd number on the road alongside of the outpourings of shops that do keep in the procession; and, on the whole, it is a moral certainty that such a purchase will prove little short of a total loss. The weaklings, of which there were a surprisingly small number, went down last year. The survivors were wise enough to break out in such vigorous profusion as to be too formidable to be captured by any temporary flurry that might come their way. In the meantime, it was realized that a certain standard of excellence did render itself manifest and that anything short of that standard would be unsafe, especially in view of the fact that automobiles have to be built in large quantities before they can be disposed of. In large quantities to influence the price, and in view of the influence of season, and the time it takes to turn them out, to be able to deliver at the propitious time, there is but the one way. Under the circumstances, it would be foolhardy to come on the market with a large quantity of "freaks." No man of business acumen would attempt it, nor can such examples be found at the show.

Let it not be supposed that the cars on exhibition are prototypes of each other. For every want there is a make of car to fill it. The respective makers have selected the *clîentele* to which they propose to cater, the result is a diversity that renders the show of far more than passing interest, and the patrons of the industry will be afforded ample opportunity to display their skill in the process of selection. If it is true that the conventions were observed in the designing of cars, it is equally true that individualism has had ample scope to render itself manifest. The patron with an "ideal" in his mind's eye will find the car to match it if he looks long enough.

NEXT COMES MADISON SQUARE GARDEN SHOW

BUT eight years ago, it was a difficult matter to stretch the meagre amount of available material at hand sufficiently to make even a passable attempt at covering the main floor of Madison Square Garden; for the Ninth National Show, which is next on the boards, January 16-23, the space on the ceiling would be utilized if that were possible. As it is, by planning and scheming, a greater number of exhibitors than has ever before been accommodated by the Garden will hold forth there in a few weeks, the official list of exhibitors showing an increase

of fully two score over last year, or a gratifying total of 294.

Standard makes of licensed cars will be grouped for the most part on the main floor, the remainder being on the elevated platform surrounding it, in the café and in the basement, while the electric vehicle exhibits will be confined to the exhibition hall. All the commercial vehicles will be in the basement. A recapitulation shows 47 exhibits of complete cars, 26 motorcycle exhibits, and 221 exhibits of parts and accessories. The exhibitors and the spaces they will occupy are as follows:

Main Floor.

- | | |
|------------------------------------|-------------------------------|
| 1 Knox Automobile Co. | 12 Electric Veh. Co. |
| 2 Matheson Motor Car Co. | 13 F. B. Stearns Co. |
| 3 Elmore Mfg. Co. | 14 Packard Motor Car Co. |
| 4 Cadillac Motor Car Co. | 15 Geo. N. Pierce Co. |
| 5 Pope Motor Car Co. | 16 E. R. Thomas Motor Co. |
| 6 Royal Motor Car Co. | 17 Chalmers-Detroit Motor Co. |
| 7 Autocar Co. | 18 H. H. Franklin Mfg. Co. |
| 8 Everitt - Metzger - Flanders Co. | 19 Locomobile Co. of America. |
| 9 Corbin Motor Veh. Corp. | 20 Pope Mfg. Co. |
| 10 Studebaker Auto. Co. | 21 Winton Motor Carriage Co. |
| 11 Lozier Motor Co. | 22 Stevens-Duryea Co. |
| | 23 Peerless Motor Car Co. |

Elevated Platform.

- | | |
|--------------------------|-----------------------------|
| 24 Selden Motor Veh. Co. | 28 Walter Automobile Co. |
| 25 Haynes Auto. Co. | 29 Woods Motor Veh. Co. |
| 26 Simplex Auto. Co. | 30 The White Co. |
| 27 Hewett Motor Co. | 32 Apperson Bros. Auto. Co. |

Exhibition Hall, Madison Avenue Front.

- | | |
|------------------------------|----------------------------------|
| 50 The Waverly Co. | 55 Babcock Electric Carriage Co. |
| 51 The Electric Veh. Co. | 56 Studebaker Auto Co. |
| 52 The Rauch & Lang Car. Co. | 57 Baker Motor Veh. Co. |
| 53 S. R. Bailey & Co., Inc. | |
| 54 The Anderson Carriage Co. | |

Basement, Commercial Vehicle Department.

- | | |
|----------------------------|---------------------------|
| 75 Knox Automobile Co. | 81 Studebaker Auto Co. |
| 76 General Veh. Co. | 82 E. R. Thomas Motor Co. |
| 77 Champion Wagon Co. | 84 Alden Sampson, 2nd. |
| 78 H. H. Franklin Mfg. Co. | 85 Hewitt Motor Co. |

Elevated Platform, Accessories.

- | | |
|--|--|
| 100 The B. F. Goodrich Co. | 140 The Duff Mfg. Co. |
| 101 The Diamond Rubber Co. | 141 The Chandler Co., Inc. |
| 102 C. F. Splittorf. | 142 Michelin Tire Co. |
| 103 Goodyear Tire & Rubber Co. | 143 Leather Tire Goods Co. |
| 104 Shelby Steel Tube Co. | 144 Adam Cooks Sons. |
| 105 The Brown-Lipe Gear Co. | 145 Avery Portable Lighting Co. |
| 106 G. & J. Tire Co. | 146 Fox Metallic Tire Belt Co. |
| 107 Briscoe Mfg. Co. | 147 Globe Machine & Stamp Co. |
| 108 Gilbert Mfg. Co. | 148 Janney, Steinmetz & Co. |
| 109 Auto. Improvement Co. | 149 Firestone Tire & Rubber Co. |
| 110 Amer. Elec. Nov. & Mfg. Co. | 150 Oliver Mfg. Co. |
| 111 Vacuum Oil Co. | 151 Timken Roller Bear. Axle Co. |
| 112 Herz & Co. | 152 Hartford Suspension Co. |
| 113 S. F. Bowser & Co., Inc. | 153 Penn. Rubber Co. |
| 114 Gray & Davis | 154 Manufacturers Fdy. Co. |
| 115 The Veeder Mfg. Co. | 155 Motsinger Device Mfg. Co. |
| 116 R. E. Dietz Co. | 156 Atwood Castle Co. |
| 117 Atwater-Kent Mfg. Wks. | 157 Byrne-Kingston & Co. |
| 118 Baldwin Chain Mfg. Co. | 158 The Wm. Cramp & Sons Ship & Engine Bldg. Co. |
| 119 N. Y. & N. J. Lubricant Co. | 159 A. W. Harris Oil Co. |
| 120 Warner Instrument Co. | 160 Brennan Mfg. Co. |
| 121 Light Mfg. & Fdy. Co. | 161 The Warner Gear Co. |
| 122 Empire Auto. Tire Co. | 162 Phineas Jones & Co. |
| 123 The Autocoll Co. | 163 The Standard Welding Co. |
| 124 The Swinehart Clincher T. & R. Co. | 164 American Ball-Bearing Co. |
| 125 Remy Electric Co. | 165 The Badger Brass Mfg. Co. |
| 126 Dow Tire Co. | 166 The Fisk Rubber Co. |
| 127 Jones Speedometer. | 167 Diamond Chain & Mfg. Co. |
| 128 Conn. Tel. & Elec. Co. | 168 Pittsfield Spark Coll Co. |
| 129 Morgan & Wright. | 169 Rose Mfg. Co. |
| 130 Continental Caoutchouc Co. | 170 Whitney Mfg. Co. |
| 131 Spicer Universal Joint Mfg. Co. | 171 The Hartford Rubber Wks. Co. |
| 132 J. H. Sager Co. | 172 A. R. Mosler & Co. |
| 133 The R. E. Hardy Co. | 173 Gabriel Horn Mfg. Co. |
| 134 Ajax-Grieb Rubber Co. | 174 Joseph Dixon Crucible Co. |
| 135 Weed Chain Tire Grip Co. | 175 Heinze Elec. Co. |
| 136 Consolidated Rubber Tire Co. | 176 C. T. Ham Mfg. Co. |
| 137 F. H. Wheeler. | 177 Valentine & Co. |
| 138 Witherbee Igniter Co. | 178 Hyatt Roller Bearing Co. |
| 139 The Republic Rubber Co. | |

Balcony.

- | | |
|-------------------------------|-----------------------------------|
| 200 McCord Mfg. Co. | 214 J. S. Bretz Co. |
| 201 Geo. A. Haws. | 215 Pierson Motor Supply Co. |
| 202 C. A. Shaler Co. | 216 Havoline Oil Co. |
| 203 W. C. Robinson & Sons Co. | 217 Apple Elec. Co. |
| 204 Cook's Standard Tool Co. | 218 Isaac G. Johnson & Co. |
| 205 A. C. Smith Co. | 219 The Auto Pump Co. |
| 206 Eastern Carbon Wks. | 220 The Rushmore Dynamo Wks. |
| 207 Allen Auto Specialty Co. | 221 English & Mersick Co. |
| 208 Jeffery-Dewitt Co. | 222 E. M. Benford. |
| 209 Morrison-Ricker Mfg. Co. | 223 K. W. Ignition Co. |
| 210 N. Y. Sporting Goods Co. | 224 Austro-American Separator Co. |
| 211 Metal Stamping Co. | 225 Wm. R. Winn. |
| 212 Hydraulic Oil Storage Co. | 226 N. Y. Coll Co. |
| 213 Hopewell Bros. | |

- | | |
|--|----------------------------------|
| 227 Voorhees Rubber Mfg. Co. | 238 R. I. V. Co. |
| 228 American Thermos Bottle Co. of N. Y. | 239 Atlas Rubber Co. |
| 229 L. J. Muttly Co. | 240 Champion Ignition Co. |
| 230 The A-Z Co. | 241 Burnet Compound Spring, Inc. |
| 231 High Frequency Ignition Coll Co. | 242 Buda Fdy. & Mfg. Co. |
| 232 H. H. Franklin Mfg. Co. | 243 Chas. E. Miller. |
| 233 Keystone Lubricating Co. | 244 Trenton Rubber Mfg. Co. |
| 234 Leon Mann Co. | 245 O. W. Young. |
| 235 P. Rielly & Son. | 246 Anderson Forge & Mach. Co. |
| 236 Phila. Timer & Machine Co. | 247 M. H. Cormack & Co. |
| 237 Jarman & Baker. | 248 Geisler Bros. |
| | 249 Wm. P. Miller Sons. |

Concert Hall.

- | | |
|--------------------------------------|---------------------------------------|
| 300 The Sprague Umbrella Co. | 314 The Pantasote Co. |
| 301 L. C. Chase & Co. | 315 Elec. Storage Bat. Co. |
| 302 Noera Mfg. Co. | 316 Manhattan Screw & Stamp- ing Wks. |
| 303 Columbia Lubricants Co. of N. Y. | 317 Springfield Metal Body Co. |
| 304 The Hess-Bright Mfg. Co. | 318 Gemmer Mfg. Co. |
| 305 National Carbon Co. | 319 C. Cowles & Co. |
| 306 The Lunkenheimer Co. | 320 Coes Wrench Co. |
| 307 National Battery Co. | 321 Never Miss Spark Plug Co. |
| 308 The Hoffecker Co. | 322 Stewart & Clark Mfg. Co. |
| 309 Westchester Appliance Co. | 323 C. A. Mezger, Inc. |
| 311 Standard Roller Bearing Co. | 324 American & British Mfg. Co. |
| 312 The Randall-Falchney Co. | 325 Rands Mfg. Co. |
| 313 Edmund & Jones Mfg. Co. | |

Second Tier Boxes.

- | | |
|---------------------------------|-------------------------------|
| 400-3 Bosch Magneto Co. | 413 The Perfection Wrench Co. |
| 404 Columbia Nut & Bolt Co. | 414 Erie Foundry Co. |
| 405 H. A. Allers & Co. | 415 Ernst Flentje. |
| 406 Traver Blowout Patch Co. | 416 The Sireno Co. |
| 407 Paul S. Reeves & Son. | 417 Duffy Grease Co. |
| 408 The Seamless Rubber Co. | 418 Coloris Mfg. Co. |
| 409-10 Sampson Leather Tire Co. | 419 Union Battery Co. |
| 411-12 Davis-Bournonville Co. | 420 Chicago Wind Shield Co. |

Third Tier Boxes

- | | |
|-----------------------------|--|
| 425 Vesta Accumulator Co. | 440 A. O. Briction. |
| 427 The Mica Core Mfg. Co. | 441 The Standard Leather Washer Mfg. Co. |
| 428 Nadall Mfg. Co. | 442 The "Lux" Auto Lamp Mfg. Co. |
| 429 Elite Mfg. Co. | 443 Quincy, Manchester, Sargent Co. |
| 430 Auto-Tire Inflator Co. | 444 Marko Storage Battery Co. |
| 431 Amer. Elec. Fuse Co. | |
| 438 John Lucas & Co. | |
| 439 H. & C. Bottle Mfg. Co. | |

Basement, Accessories.

- | | |
|--|--------------------------------|
| 500 Patterson, Gottfried & Hunter. | 513 Vehicle Apron & Hood Co. |
| 501 Healy Leather Tire Co. | 513a Hill Dryer Co. |
| 502 C. J. Downing. | 514 Amer. Thermo-Ware Co. |
| 503 Kitsee Storage Battery Co. | 515 Chilton Printing Co. |
| 504 The Class Jour. Co., (Motor Age). | 516 Auto. Supply Mfg. Co. |
| 505 The Class Jour. Co., (Automobile & Auto. Trade Dir.) | 517 Lavalette & Co. |
| 506 Horseless Age. | 518 Perfection Spring Co. |
| 507 Albert Champion Co. | 519 Automobile Topics. |
| 508 E. T. Burrows Co. | 520 Automobilia, Ltd. |
| 509 Stromberg Motor Devices Co. | 521 The New Departure Mfg. Co. |
| 510 Julius King Optical Co. | 522 Stanley & Patterson. |
| 511 Livingston Radiator Co. | 523 Vanguard Mfg. Co. |
| 512 The White & Bagley Co. | 524 Merchant & Evans Co. |
| | 525 Motz Clincher T. & R. Co. |
| | 526 The Post & Lester Co. |
| | 527 Motor. |

Basement, Motorcycle Department.

- | | |
|--------------------------------|---------------------------------|
| 529 Merkel Light Motor Co. | 544 Harley-Davidson Motor Co. |
| 531 The Consolidated Mfg. Co. | 545 The Auto-BI. Co. |
| 532 Excelsior Supply Co. | 546 Thiem Mfg. Co. |
| 533 N. S. U. Motor Co. | 547 The Motor Car Equipment Co. |
| 534 Motorcycle Pub. Co. | 548 Walton Motor Co., Inc. |
| 535 American Motor Co. | 549 H. & F. Mesinger Mfg. Co. |
| 536 Hendee Mfg. Co. | 550 G. H. Curtiss Mfg. Co. |
| 537 F. A. Baker & Co. | 551 Eclipse Machine Co. |
| 538 The Pierce Cycle Co. | 552 New Era Gas Engine Co. |
| 539 Bicycling World Co. | 553 Reliance Motor Cycle Co. |
| 540 Ovington Motor Co. | 554 Crouch Motor Co. |
| 541 Reading Standard Co. | 555 The Persons Mfg. Co. |
| 542 Aurora Automatic Mach. Co. | |
| 543 Hornecker Motor Mfg. Co. | |

Basement, Accessories.

- | | |
|---------------------------------------|--------------------------------|
| 556a G. L. Econimizer Co. | 561 Pratt & Whitney Co. |
| 557 Comptoir D'Innovations Pour Auto. | 563 Phila. Storage Battery Co. |
| 559 Nathan Novelty Mfg. Co. | 564 Troy Car. Sun Shade Co. |
| 560 Noonan Tool & Mach. Co. | 565 The Garvin Machine Co. |
| | 566 Faultless Auto Tube Co. |

W. K. V. JR., TRIES CUBAN ROADS.

HAVANA, Dec. 28.—Governor Magoon, who retires from office January 1, received a sincere compliment together with personal congratulations from William K. Vanderbilt, Jr., and a party of friends who have been motoring through Havana Province. They declare great satisfaction with the new roads built by Governor Magoon, saying that they compare favorably with the well-known roads in France. Cuba is also recommended by this party as a touring place at this time of year, the scenery being beautiful, the aspect of the towns and the character of the people commendable, which, with the smooth roads, make this portion of the country a new and delightful touring ground. Mr. Vanderbilt's party is traveling on his turbine yacht *Tarantula*, and autos are carried along.

PRESIDENT-ELECT TAFT BELIEVES IN AUTOING.

That President-elect W. H. Taft is going to be a good autoist is demonstrated by his continuous use of a White steamer at Augusta, Ga., where he is spending a Winter vacation. Mr.



President-Elect Taft as a White Steamerite.

Taft's family is shown in the picture herewith given, and the commodious car answers for family uses of various kinds.

In the photograph Mrs. Taft is sitting next to the President-elect on the rear seat; the older children, Robert and Helen, are sitting in the revolving seats, and Charlie, the youngest child, is next to the driver, H. N. Searles, who has been in charge of President Roosevelt's White cars for two years.

MICHIGAN CITY TO SUPPLY MUNICIPAL AUTOS.

LANSING, MICH., Dec. 28.—Apparently not to let the reputation of Lansing as an automobile town suffer, the local Council and the manufacturers are designing to furnish automobiles to all the city departments. The new Webb fire engine on an Oldsmobile car has been in use by the fire department for a month now, and it has shown up so well under all manner of difficult tests that there is no question that it will be accepted. In addition to this, the Oldsmobile company has furnished the fire chief with a special car for his use, and now it is reported that the same manufacturers will donate an auto to the chief of police.

D. S. LUDLUM, NEW AUTOCAR MANAGER

PHILADELPHIA, Dec. 30.—Announcement has been made of the resignation of David S. Ludlum as assistant cashier of the Philadelphia National Bank to assume the presidency and general managership of the Autocar Company, of Ardmore, one of the pioneer and best known automobile plants in the country.

Mr. Ludlum's abilities, coupled with his successful business career, qualify him for the responsibilities and duties which devolve upon the manager of so large a concern.

While coming into contact with many great business enterprises of the country, Mr. Ludlum was attracted by the automobile industry as a field of great opportunity for immense development, and particularly that field comprising the commercial side of the industry. This is the field to which the Autocar Company is now devoting the major part of its capacity, having during the past two years perfected a commercial chassis of a special design, of high efficiency and much flexibility, including delivery wagons, town cars, taxicabs, etc.

It is predicted by those who know Mr. Ludlum's personality that he will not be long in becoming prominently known in this promising field of the manufacturing world.

John S. and Louis S. Clarke, who were the founders of the Autocar Company, will retain their positions of vice-president and consulting engineer and continue their present active connections with the company.

POSSIBLE CORBIN REARRANGEMENT.

HARTFORD, CONN., Dec. 28.—Howard S. Hart, former president of the Corbin Motor Vehicle Corporation of New Britain, has made two distinct offers to buy out the concern. The last offer was made a few days ago, but did not prove entirely satisfactory to the controlling interests. Before Mr. Hart retired as president of the company he had things pretty well in hand, so that matters are now quite satisfactory to the stockholders. It is understood that Mr. Hart was to have formed a large company for the manufacture of the Corbin cars in the event of his offers being acceptable. There is a strong desire to segregate the motor car business from the affairs of the American Hardware Corporation, and some time ago a committee was appointed to look into the workings of the Corbin Motor Vehicle Corporation. The directors of the American Hardware Corporation will hold a meeting on Wednesday of this week and a report on the Corbin situation will be submitted in all probability. Mr. Hart has said that there is at present no open proposition on, and if any advances are made they must necessarily emanate from the Corbin Motor Vehicle Corporation. The outcome is awaited with much interest.

POPE COMPANY NOW IN COMMAND.

HARTFORD, CONN., Dec. 28.—On Saturday of this week, January 2, the Pope Manufacturing Company will anticipate the payment of \$267,000 of its 6 per cent. notes, issued under the reorganization plan and due August 1, 1911. This will leave \$533,000 of notes outstanding, of which \$266,000 mature August 1, 1909, the balance August 1, 1910. The subscribers to the notes are called upon for the payment of the balance of their subscriptions January 2, 1909.

Vice-Chancellor Howell, of Newark, has authorized the receivers of the company to pay the final dividend of 25 per cent. and 6 per cent. interest to the creditors.

CLAIMS AN ORDER FOR A THOUSAND.

YORK, PA., Dec. 28.—The Hart-Kraft commercial car recently made its first appearance on the streets of York, when a local department store put on the new delivery wagon. The new car made quite a hit with a number of York merchants, and as soon as orders can be filled, there will be a number of the new cars on the streets within a very short time.

AUTOMOBILE ROW OF COUNTRY'S METROPOLIS

AUTOMOBILE ROW," New York City, extending in Upper Broadway for forty blocks north from Forty-second street, is a livelier scene to-day than ever before in its short history, although the era of removal from the little, old "Row" of five years ago in Thirty-eighth street, only a short block in length, has been completed, and the wonderful expansion in salesroom and garage facilities that occurred in 1906 and 1907 has been succeeded by a temporary lull to allow the normal growth of trade to catch up.

There are very few vacant salesrooms in "Automobile Row," and such as are idle have been so only a short time and are not likely to remain vacant long, notwithstanding rentals are high. The only big garage that has been erected in Broadway this year has just been completed at Sixty-fourth street. It was built by capital outside of the automobile industry and is the largest garage and sales establishment on Broadway. It was erected by Robert Goelet, and is of concrete construction, thoroughly fire-proof and up-to-date. Enough applications for space in the new Goelet building have been received, it is said, to fill it several times over, and it is expected that occupancy will begin early in the new year.

The only other large garage that is vacant stands at Broadway and Fiftieth street and has never been occupied since it was erected about three years ago by the Wendel estate, which has refused many offers from automobile concerns to lease it.

Garages on side streets where rentals are lower, are in active demand by new taxicab operating companies, which have had great difficulty in finding suitable quarters. The New York Taxicab Company, which operates 600 Darracq motor cabs, has just completed and occupied a new fire-proof brick garage in West Thirty-seventh street near Tenth avenue. The cost of construction was about \$200,000. During the past Summer and Fall the company was obliged to keep more than 100 of its cabs in live storage under a big circus tent in a vacant lot on Eighth avenue between Fifty-seventh and Fifty-eighth streets. It also has unexpired leases on two old livery stables in West Sixtieth and West Sixty-second streets, just off Broadway, which it has occupied since it started the taxicab era in the Fall of 1907.

Cost of Broadway Garages.

Garages in Broadway range in cost from \$100,000 to \$500,000 each, and it is estimated that they have a combined capacity to house about 10,000 automobiles. The development of "Automobile Row" has been so rapid that there are few remaining available sites for large garages between Forty-seventh and Seventy-second streets. Three large garages erected by the Century Realty Company at the northwest and southwest corners of Broadway and Sixty-second street were leased at full market rates by the builders and before the completion were sublet by the lessee at almost double the first rentals.

Although five years ago the greatest "Automobile Row" in the world was the Avenue de la Grande Armee, in Paris, New York's "Automobile Row" in upper Broadway now exceeds it in the attractive character of its salesrooms and garages and also in volume of sales. The new Thoroughfare building, occupying the block in Broadway between Fifty-seventh and Fifty-eighth streets, has become a very beehive of dealers in motor car specialties. While little building was done by automobile companies during the past year, the coming year is sure to see renewed activity, since it has been announced recently that the Peerless Motor Car Company has bought a large plot of ground at Broadway and Fifty-seventh street and intends to build a large modern salesroom for its own use; and A. T. Demarest & Co., the carriage builders and agents for several foreign cars, have leased an adjoining plot for the erection of a new building on the immediate corner of Fifty-seventh street. This move is particularly significant of the decline of the fine carriage trade

and the rise of the automobile to fill the vacancy thus made.

Plans for new buildings specified as garages filed with the Department of Buildings during the year 1908 had a combined estimated cost of \$320,000 for five structures, as compared with \$272,000 for nine garages for which plans were filed during 1907. These figures, however, are no criterion of building activity or of value of Broadway garages, since many of the latter are specified as salesrooms and storage, while the smaller garages are for private use.

Enormous Retail Trade of Metropolis.

The extent of the automobile retail trade in New York is so great that it would be a herculean, if not actually an impossible, task to arrive at even an approximately accurate record of sales. This can be done only by the active and honest co-operation of all of the branch houses, agencies and importers through such a central organization as the New York Automobile Trade Association and the affiliated Importers' Automobile Salon. The time for this does not appear to have arrived yet, however, and until the trade has settled down more and managers have more time to devote to the interests of the trade as a whole instead of to individual interests, there is no inducement to establish a statistical department for the keeping of lists of dealers and records of sales.

From the carefully revised lists of "The Automobile Trade Directory" we find that in Manhattan and the Bronx there are about thirty branch houses of American motor car manufacturers, about seventy additional agencies for American cars, and thirty agencies for foreign cars. There are seven automobile manufactories in the city itself. In all, there are 125 garages for the care and storage of machines, as distinguished from salesrooms, and thirty of these are equipped as charging stations for electric vehicles. Fifteen shops make a specialty of repairing only. Of jobbers in sundries and supply dealers there are thirty-three. In Brooklyn there are forty agencies for automobiles—nearly all domestic—and there are sixty garages.

Development of the Taxicab.

One of the most remarkable developments of the year just closed is the taxicab business. Very few persons, even in the automobile industry itself, have any real conception of the rapid growth of this new business, which did not exist at all two years ago. The lists show that there are more than forty companies and livery stables in New York City now engaged in operating motor cabs equipped with fare calculating and indicating instruments. While many of these are small and operate only a few machines, it is safe to say that there are half a dozen that are running fifty or more cabs, and that there are now more than 1,000 taxicabs at work in the metropolis.

Sales During the Year.

Sales of cars during the past year in this city can be arrived at only roughly by calculation from State registrations in Albany. A store-to-store canvass would, if anything, be less accurate owing to the unwillingness of many dealers to divulge the exact amount of their business. In New York State the surprising number of 65,000 automobiles have been registered during 1908. Some 15,300 of these are new registrations that did not appear the year before, and, according to the Auto Directories Company, 60 per cent. of these, or 9,180, are from Greater New York. Of this number, 20 per cent. may be assumed to be transfers of second-hand cars, since the State Law requires the issuance of a new license and cancellation of the old one when a car changes owners.

Thus, we find that the actual sales of new cars for the year aggregated 7,340. As New York is the greatest market in the country for high-priced cars, and the branch houses, importers and agents for high-class machines outnumber the medium and

low-priced agencies, it is a conservative estimate that the average price of cars sold is \$2,500. Placing the year's sales at the round figure of 7,000, this gives a total volume of business in complete cars alone of \$17,500,000. It is entirely out of the question to calculate the money spent in accessories.

Outlook Exceedingly Bright.

Regarding the outlook for business during the coming year, there seems to be but one opinion—that it is better than it ever was and that the volume of sales will be greater by far than ever before. The purchasing public appears to have recovered fully from the influence of the financial depression, and sales during the past Fall and early Winter have been away ahead of sales for a like period at any time in the past. For example, Manager M. J. Budlong, of the Packard branch, says that 400 Packards have been sold through the New York house and that the 1909 output is almost disposed of already. According to W. P. Kennedy, of the Studebaker Company, their business is fully 100 per cent. better than in 1907. Sales have this season continued right up to the end of the year, notwithstanding the proximity of the shows. One promising feature of the New Year's outlook is the increased sales that may be expected as a result of purchases deferred last year owing to general business depression and uncertainty. An indication of the trend of business is the fact that the State registration during the closing months of the year ran 100 a day more than a year ago.

Electric vehicles continue to hold favor as town cars and to supplement the big gasoline limousine and touring car.

In the Commercial Vehicle Field.

During the past year gasoline trucks and delivery wagons have made considerable advance in New York, a field previously recognized as a stronghold of the electric commercial vehicle. Of the twenty-five Packard trucks built and sold during the year, a dozen came to New York, and half of these were taken by the Adams Express Company. Frayer-Miller, Hewitt, and Knox trucks are coming into increased prominence in the streets, together with some Waltham, Rapid, and Lambert machines.

In the electrical field, the Studebaker, General Vehicle and Baker people are most active. It is noteworthy that the Studebaker company purposes to devote its energies in New York City chiefly to pushing its truck business, gradually dropping the electric pleasure carriage trade. Through a corps of special salesmen with an engineering training, it is negotiating with leading concerns whose business is of national and international proportions such as the American Sugar Refining Company. It has been working quietly along new lines, and the results are only beginning to appear, but before the end of the year the local branch expects to be taking orders whose magnitude will surprise the trade. The Baker company anticipates a good business in its new light delivery wagon. After a six months' trial of one of these wagons fitted with express body, the engineer of the American Express Company has strongly recommended the purchase of sixteen of the same model. The General Electric Company, which now owns the General Vehicle Company, formerly the old Vehicle Equipment Company, of Brooklyn, is making careful investigations of the motor truck situation, and is planning a more active campaign with the new models which have been much improved—in fact, almost completely re-designed. The Couple-Gear Company has also entered the field with a local agency.

The tire trade of the Metropolitan district is handled wholly through branch houses which are maintained by all of the leading tire manufacturers of the country and by the Michelin and Continental companies of France and Germany, which now have American factories.

Changes Among the Agencies.

As usual, many changes have occurred among car agencies during the year, some dealers dropping out, others starting in and still others reorganizing and changing names. Of principal note among those that have quit business are the Garford Motor

Car Co., whose business is now handled by Studebaker; the Dragon Automobile Company; A. G. Southworth, who had the Pope lines; the Electric Vehicle Company, which went into receiver's hands; the Rainier Company, also in receiver's hands; the Mercedes Import Company, and the Maja Company, Ltd.; the Palais de l'Automobile, which had the agency for the Delaunay-Belleville, now handled by Brewster & Co.; Archer & Co., who handled the Hotchkiss; J. S. Heller, who had the Züst, now in the hands of a new company called the American Züst Company, with Walter Sykes as president; the McLean Auto Company, which had the Lambert agency; Cincinnati Motor Car Co.; Bouton Motor Co.; Rolls-Royce Import Co.

Altogether, including agencies and garages, there have been forty discontinuances in Manhattan during the year just closed. Against this showing, however, sixty new concerns have been launched, showing a net gain of twenty—which is not at all bad for a panic year. One development of some interest is the opening of an agency for Clement dirigible balloons by Sidney A. Bowman, agent for Clement cars.

Especially notable among the new establishments are the branch houses of the Moon Motor Car Co., of St. Louis, at 2186 Broadway; the Mora Motor Car Co., of Newark, at 1670 Broadway; the De Luke Motor Car Co., of Detroit, at 1633 Broadway; the Babcock Electric Carriage Co., of Buffalo, at 1591 Broadway; the Buick Motor Co., of Flint, Mich., at 1733 Broadway; the Jackson Motor Car Co., of Jackson, Mich., at 1720 Broadway; the Johnson Service Co., of Milwaukee, at 36 East Twentieth street, and the Regal Motor Car Co., of Detroit, at 125 W. Sixty-eighth street. Other important additions are the new local manufacturing concerns, as the Adams Vehicle Co., at 1677 Broadway; Benner Motor Car Co., at the same address; Fulton Motor Car Co., at 370 Gerard avenue; and the Peets Mfg. Co., at 60 W. Forty-third street; also, the new American Automart garage, at 1621 Broadway, the Apthorpe Motor Car Co., with salesroom and garage at 214-18 W. Eightieth street, and others. Several notable changes have also occurred among prominent dealers, such as the separation of Messrs. Hollander and Tangeman, of the Hol-Tan Co., and the organization by one of the members of the Fiat Automobile Co., formerly controlled by the Hol-Tan Co.; the organization of the Hamilton-Kull Co. to succeed the Kull Automobile Co., and the formation of the Wayne Motor Car Co., of New York, to handle the Wayne, formerly sold by the Kull company, and the advent of the Carl H. Page Co. to take the agency for the new Chalmers-Detroit. In losing the Buick agency through the establishment of the Buick branch, the Koehler Sporting Goods Co. gets in its stead the agency for the new E-M-F.

In the ranks of the importers there have also been important changes, as indicated by the entrance during the year of the American Züst Motor Co., at 1899 Broadway; the Benz Auto Import Co., with Jesse Froelich as president; the Delahay Import Co., at 587 Park avenue; Hotchkiss Import Co., at 1855 Broadway; Isotta Import Co., at 1620 Broadway; Societe des Automobiles and S. P. O. Automobile Co., both at 1966 Broadway, and the Universal Taximeter Cab Co., at 153 E. Fifty-third street, which has just announced the Argyll taxicabs.

Statistics of New York City Trade, January 1, 1909.

MANHATTAN AND THE BRONX.

Branch houses American car factories.....	30
Agencies for American cars.....	70
Agencies for foreign cars.....	50
Local manufacturers of complete cars.....	7
Total number of garages.....	120
Electric charging stations in garages.....	36
Exclusive automobile repair shops.....	15
Number of taxicab operating companies.....	44
Branch tire houses and agencies.....	20
Number of supply dealers.....	33

BROOKLYN.

Agencies for American cars.....	40
Number of Garages.....	60

JANUARY 1, 1908, TO JANUARY 1, 1909.

Estimated number of cars sold in Greater New York.....	7,344
Estimated aggregate value of cars sold.....	\$17,500,000
New salesrooms and garages opened.....	60
Concerns discontinued or name changed.....	40

INDUSTRY'S MAGNITUDE IN CHICAGO ASTONISHING

CHICAGO, Dec. 28.—The magnitude of the motor industry in Chicago is not appreciated until one starts in to review the business of a single year, then it dawns upon him that the Windy City can compare most favorably even with Detroit, the heart of motordom. The comparison may not hold good so far as the construction of motor cars is concerned. Detroit certainly has us there, but it is doubtful if it can outpoint us in the other departments, for there are represented in Chicago more concerns that are allied with the motoring industry than are to be found in the Grand Central Palace this week—makers of motor cars, manufacturers of motor buggies and of sundries, parts and accessories by the score. There are exactly 302 manufacturing concerns in Chicago allied to the motoring industry.

Chicago certainly is the center of the motor buggy manufacturing business, for here are made no fewer than ten different makes of the high-wheelers—the Holsman, the Duer, the Reliable Dayton, the Monitor, the Bendix, the Ranger, the International Harvester, the Black, the Bugmobile and the Chicago Motor Buggy Company's product. Here, too, are found such commercial rigs as the Holsman, the Gifford-Pettit, the Monitor, the Randolph and the Fairbanks-Morse, while in the pleasure car line we have the Diamond T, Silent Knight, Falcon, Lauth-Juergens, Triumph, Monitor, Monarch and Pullman. In the electric line there is the Woods Motor Vehicle Co., while the Jay Motor Co. is experimenting with a steam car.

Chicago's Manufacturing Strength.

Touching on the manufacturing industry as a whole in Chicago, it is discovered there are listed 242 different articles made here, ranging from a big motor car down to insulated wire, each and every one contributing its share toward making this city a motoring metropolis. In the allied branches there are five makers of bodies, five of carbureters, seventeen of wind shields, sixteen of tops, fifteen of castings of all sorts, twelve of motors, two of speedometers and so on down.

Turning to the retail end, it is found there are more than eighty different makes of cars represented—eighty-one to be exact, if the writer counted right—while of these twenty-one are represented here by branch houses. There are eight big supply houses, four of which also act as jobbers, while there are fourteen tire concerns represented here by branch houses and several others have agencies.

Still continuing the census and aided by the telephone directory one finds that this city fairly bristles with public garages, which are as hard to locate as it would be to count the livery stables in the city. Most of them are prosperous enough to have a telephone installed, so there is no reason to question the veracity of the directory which gives 118 motor car garages. Many of them are little affairs—old stores or ancient livery stables remodeled for this purpose, but there are a dozen or so places which could stack up against the best in the land and which have every convenience imaginable and house all the way from 100 to 300 cars each.

Motor Livery Business.

In the same line there are motor livery businesses by the dozen. But few of them are of the first flight, the majority having from one to three or four old cars which are used for the renting business. In addition there are half a dozen stands downtown where cars are ranged alongside the curb for public hire. There are half a dozen concerns which can be dignified by calling them motor liveries, and these half dozen have in service some 100 rigs, of which about seventy-five are taxicabs and the rest touring cars. Chicago likes the taxicabs and would have more of them. It will by spring, at which time it is expected there will be three times as many running as there are now. Only one of the taxicab companies fits the taximeter to the rear wheel, and this, it is

said, may be stopped by means of a city ordinance which even now is in course of preparation, it being claimed that instruments so attached are liable to run up false mileage.

Season Slow to Open.

So much for Chicago's strength. Now as to the past year. Inquiry in all the trade centers of the town would seem to indicate that Chicago's experience has been about the same as the other big cities. The financial flurry, as we like to term the panic of last Winter, crimped everyone to start out with, and it was late in the Summer before the buyer came out of his cyclone cellar and sat up and took nourishment. Then he made up for lost time and those dealers who had counted on long vacations in the early fall found themselves so tied down by business that there was no chance of getting away. Those who had had any surplus stock on their hands by September found it no trouble at all to get rid of the cars and 1908 goods were selling well even when the 1909 crop was coming in to the market. As elsewhere those who were selling low-priced and medium-grade cars found themselves busy despite the supposed hard times. It would seem as if those who had figured on buying high-priced cars contented themselves with something cheaper when they found their bank account endangered. They had to have the cars, even if hard times did threaten, and in this many dealers found their salvation.

Big Cars Sell Well.

Still it wasn't a bad year for the big fellows, either, and it is more than probable that on the average there were fifty cars of each of the high-priced makes sold in town, which would make from 350 to 400 cars selling at better than \$3,000. Foreign machines did not show up prominently because Chicago is not addicted to the European habit, there being only two makes, the Renault and Berliet, directly represented here. The former has a branch, while the latter is represented by the Berliet Import Co., which has the sales right for the United States.

If one should hazard a guess and say 2,000 cars were sold directly in Chicago this year he would not be far out of the way. There are some 18,000 cars registered in the State and undoubtedly one-third of these hail from Chicago. When the city collected the registration fee it had some 5,500 cars on its list, but this came to an end a year ago last July. This leaves only one way to find Chicago's strength and that is through the city comptroller, who counts noses for the wheel tax. He reports some 5,700 cars, but these do not take in the suburbs, where probably a couple of thousand more cars are located which properly come under a Chicago heading. This would make nearly 7,500 cars for Chicago, which would make it about 2,000 new ones for the past year.

Magnitude of Wholesale Business.

But Chicago dealers have not been solely occupied selling cars locally. Most of the dealers have big territories, some of them running into Iowa, Indiana, Wisconsin and Nebraska, and some even taking in St. Louis. Therefore, in summing up the business of the year that has passed through Chicago this must be taken into account. Then, too, there are big branch houses like the Buick, Ford, Rambler and Maxwell which have been passing out cars at wholesale in vast quantities. One of these concerns is credited with disposing of 1,400 cars altogether through the local branch, so it will be seen that during 1908 Chicago has acted as a clearing house for thousands of cars in this territory.

Chicago, too, is a center for the supply business, and one man who keeps a finger on the motor trade pulse declared the other day that five of the supply houses and the garages in the outlying districts had sold goods that totaled \$1,500,000. He figured that these garages combined had done just about as much busi-

ness as did the five supply houses whose business he had reckoned in his estimate.

Chicago's motor row is changing every month. Slowly but surely it is moving southward, while the cracks and crannies in the middle are being filled up. Wabash avenue is nearly deserted. The Studebaker is camped there still and so is the Orient, but the Chalmers-Detroit, Lozier and Autocar as represented by the Levy & Hipple Company, is about to join the Michigan avenue colony, while the Dorris already is there. Few new buildings have gone up, though. The Levy & Hipple Company is building near the Stoddard-Dayton agency, the Knox has just moved into a new place between the Buick and Rambler, while the Motor Car Supply Co. is about ready to take possession of a handsome two-story structure a few doors south of its present location. The Dorris is in a new building just south of Eighteenth street, while the new Oldsmobile branch is in a recently-built establishment just north of Walden Shaw's. The Swinehart tire, too, has a new place of its own.

Changes on the Row.

Kaleidoscopic changes, though, have taken place along the row. Some have dropped out and others have come in, so if anything Chicago has gained rather than lost in strength. Of the twenty-one branches now here nine of them have come in during the present year. Palmer & Singer, Oldsmobile, Locomotive, Renault, Meteor, Velie, Babcock, Austin, and the Overland are new. Of these the Locomotive, Overland, Oldsmobile and Kissel have switched from agencies. The Velie is just locating, having taken the store now occupied by the Packard agency, which intends moving to the south end of the row next May. The Stanley is coming in with a branch for 1909.

Agency changes have switched the Premier to Webb Jay, who gave up the Kissel. Shaw gave up the Premier, Reo and Locomobile to handle the Berliet and Thomas, the latter transferred from Coey, who took up the de Luxe. The Reo went to the Reo Automobile Co., while the Chalmers switched from a branch to an agency when it dropped the Thomas. The Bird-Sykes Co. took the Matheson when the Palmer & Singer branch opened with the Palmer & Singer line. Githens landed the E-M-F when the Olds people decided to have a branch Branstetter as representing the Kissel.

New cars that came into town during the year include the E-M-F, P & S, Gyroscope, Waverley, Regal, Brownickar, Austin, French Berliet, Midland, Falcon, Oakland, Pittsburg Six and Velie, while those which have dropped out include the American, Marion, Wayne, Cleveland and National. Of these the Marion and Wayne have gone out of business.

Row Moving South.

Apocryphos of this tendency on the part of the row to shift to the south where the rents are cheaper, it is stated that some time next Spring there will be a migration on the part of some of the big dealers to the district around Twenty-second street. It is said that some of the representatives of the high-powered cars believe they could establish a colony on Indiana avenue or Wabash avenue near Twenty-first street and do well. It is believed, though, Indiana avenue would be best suited for the purpose. That's where the new Stanley branch is being constructed. Walden Shaw is one block west from this, facing on Michigan avenue. Next door to Shaw is the Oldsmobile branch. The Packard agency is going to move in the spring, but just where it is not stated. At the present time it is on Michigan avenue just south of Sixteenth street, but that its intentions in the matter are sincere is shown by the fact that it has leased its present quarters to the new Velie branch. It is hinted, but the hint has not been confirmed, that the Packard people are looking with favor upon a site still farther south.

The commercial proposition is gaining a strong hold in this city. At first it was slow work because of the condition of the streets upon which business traffic is permitted. Dealers in business rigs, however, say this is no longer so now, because of the wheel tax which the city has imposed and which it already is

collecting. This reaches a vast sum, about \$700,000, and it is the intention of the authorities to devote it all to the improvement and maintenance of the city streets. Considerable work along this line already has been done, but the job is one of such a vast magnitude that one does not appreciate what has been accomplished. Another year ought to make a difference and by that time the demand for commercial motor wagons ought to be much better.

Many Commercial Rigs.

A conservative estimate of the number of commercial rigs in operation on the city streets at the present time places it at 250 machines, ranging in size from the fleet of little Orions used by Stevens to the big 3 and 5-ton trucks working for the packers. The trucks have made a particularly strong impression at the stock yards and Swift and Morris, two of the leading packers, declare that one of their motor trucks can do the work of five horse-drawn rigs. An instance is cited where one of the Reliance 3-ton trucks working for Morris started in at 7 o'clock in the morning to transport seventy-five tierces of lard, each weighing 450 pounds, to a point six miles away. This represented 33,750 pounds, but the truck was through its work by 3:30 o'clock in the afternoon. Another instance is given where a four-cylinder truck carried 200 cases of beer in one load for Schoenhofen.

As showing the diversified interests using commercial motor trucks in Chicago, the list is made up of such concerns as Montgomery Ward & Co., the big mail order house, one of the earliest of Chicago houses to take up the motor truck; A. H. Revell & Co., the furniture house, which also broke into the game early; the McAvoy and Schoenhofen breweries, Sears, Roebuck & Co., another mail order house; the Price Baking Powder Co., the *Daily News*, Stevens & Co., Frank E. Scott, the transfer man; the David Parker Moving Co., the Harbor Van Co., the Wisconsin Tea Canning Co., Anglo-American Provision Co., Anderson Brothers Teaming Co., the Valvoline Oil Co., Omaha Packing Co., National Lead Co., the public library, the National Casket Co., Lyon & Healy and the Cable Piano Co.

Representatives of these commercial trucks say that their chief difficulty is not with the streets of Chicago, but with the drivers. While there are some good men piloting these big rigs the demand is greater than the supply. It is easy enough to get drivers, they say, but the most of them lack experience and ability. As soon as it is possible to man the commercial rigs properly then the commercial proposition in Chicago will be a good one.

Electric Growing in Popularity.

The electric is gaining a good foothold here because of the many miles of magnificent boulevards, many of them asphalt, affording an easy and luxurious way for the society woman to drive into the business district. Many of the women make a practice of driving downtown morning and evening, carrying their husbands to and from business. The men, too, like the electrics, and many of the electrics are piloted by business men who enjoy the leisurely pace. Especially is this so this Winter when the warm coupé bodies make riding in an electric a luxury. And one travels more leisurely in inclement weather.

Seven makes of electric rigs are now represented in Chicago, two of them branches, the Woods and the Babcock. The Woods factory also is here and the plant is pushed to its fullest capacity to keep up with orders. In addition to these two the Rausch & Lang, Detroit, Baker, Columbus and Waverley are represented by agencies, and it is said it is the intention of the Fritschle to open up here in the Spring.

Statistics From Chicago.

Estimated number of cars sold from Chicago, wholesale and retail	10,000
Number of makes represented	81
Number of branches	21
Number of agencies	66
Number of garages	118
Number of supply houses	8
Number of manufacturing concerns	302
Number of articles manufactured	242
Number of motor buggy makers	10

BOSTON IS NEW ENGLAND'S AUTO HUB

BOSTON, MASS., Dec. 28.—When statistics are given out dealing with motor cars and the motor industry they run into large figures. Sometimes these are really surprising, and it takes much argument to convince the ordinary person and even then with facts and figures there still remains an air of doubt. So when it is said that during the past year—allowing a little more than since the first of January, of course; or to go back to the beginning of the 1908 selling season—that some 3,500 cars were sold in Boston aggregating something like \$7,000,000, placing the average at \$2,000 a car, the statement is apt to meet with skepticism. Yet that seems to be a reasonable, conservative estimate. Of course, no one expects that each dealer in Boston is going to tell just how many cars he sold. In fact, this air of mystery which surrounds the sales of motor cars is one of the novel things connected with the business. However, there is a way of striking averages which may give some idea of the sales. When it is considered that something like seventy cars were represented in Boston during the year, that would mean an average of fifty cars sold by each dealer

17,000 Cars Registered.

There are 17,000 cars registered in the State. Allow 3,000 as being reregistrations of one owner to another and there is left 14,000. Cut the latter number in two and grant that 7,000 are machines owned by men a year ago; that leaves another 7,000 as being approximately new cars bought within a year. Now there are nearly 3,000,000 people in the Bay State and of that number more than one-third may be found within a few miles of Boston. The eastern portion of the State is, of course, the more thickly settled, so the statement is not too broad to claim that two-thirds of the people live within a radius of twenty-five miles of the Hub. Is it too much then to claim that half of the motor cars sold in the State were delivered by Boston dealers? Certainly not.

Sixty-Five Makes Represented.

There are now in Boston representatives of about sixty-five motor cars. Of these fourteen are branches, while the other fifty-one are represented by thirty-one agents selling on commission, some having two or three cars. All things considered the past year was not a very bad one despite the cry of panic and hard times. There were not so many changes when it is considered that there are so many agencies in Boston. The new cars that come here were not numerous, and those that dropped out or changed hands did not create any great stir.

When the situation is really analyzed it will be found that the new arrivals balance what changes and withdrawals have been made during the year, leaving the conditions numerically about the same, but the industry in a more healthy condition.

Boston should be a very good field for the electric vehicle. Still, there is not the steady growth in these machines that there should be. The city is level, the streets are well kept; there are plenty of places to get batteries recharged, yet the number of electrics seen on the streets is not enough to make one accustomed to seeing them. There are agencies here for the Studebaker, Columbia, Babcock, Baker, Bailey and Columbus and more attention is being given to their sale now.

The Commercial Situation.

Commercially, Boston is taking kindly to the horseless vehicle. To stand now and watch traffic in any one of the busy streets will show an entirely different scene than was presented a year ago. There are all sorts of commercial vehicles in use now. Caterers, florists, hospitals, express companies, furniture men, dry goods stores, banks and even a large undertaking company has within a few weeks joined the list, to say nothing of the dozens of trucks now used by the Edison Electric Co. and the New England Telephone Co. It makes a really striking array and speaks well for the men who have been selling these ve-

hicles. There are represented here, among others, the Rapid, Logan, Knox, Maxwell, Packard, Frayer-Miller, and within a short time there will be some more new ones.

The one thing in the industry that has attracted attention in this city above all else recently is the taxicab service. Beginning with a couple of cabs put in some months ago by E. P. Blake, of the Jackson, there suddenly came into being during the summer companies using dozens of the little vehicles. One of the companies put in a lot of Thomas cabs, and the other put in Berliets. There were also put in some Atlas cabs. Then some of the cabmen purchased one, two, or three to make some sort of a showing as they saw their trade falling off. So now there are perhaps about seventy-five of them in the city and the end is not yet. Whether the taxicab business will be overdone is a question that some of the men who have followed the motor game for years are wondering at now. The city is not large and it does not take long to cover it from north to south and east to west, and with a system of tunnels it is easy to make connections in a short time, so with too many of the taxicabs there is apt to be a falling off in receipts. They will be patronized much for some time because of the novelty, naturally, but eventually they will get down to a basis where the dividends on the capital invested may not be as large as expected.

Million Invested in Real Estate.

There is more than \$1,000,000 invested in the real estate that houses the motor car agencies alone, not to mention all the buildings now occupied by men affiliated with the industry in the repairing, tires and accessory line. Some of these buildings were constructed especially for the motor industry. There is, for example, the Motor Mart in Park square, in which are housed the Packard, Cadillac, Marmon, American, Buick, Chadwick, Speedwell and a number of other cars. It is a large circular structure right at the very door of the trade, being a sort of a hub from which the spokes go to the west. The greater number of garages is within a section 1 mile long by 1-4 mile wide. These buildings, it must be understood, were not all erected during the past year, but as this is perhaps the first comprehensive review of conditions in Boston it is not out of place to mention them.

Naturally with so many cars in Boston, and all New England to draw upon practically, the tire branches here are more than mere small stores for selling a few sizes. Each concern has an up-to-date branch where all the sizes are kept in stock ready to be sold or shipped quickly anywhere. This means very large quarters, of course. The Diamond, Goodrich, Goodyear, Firestone, Fisk, Morgan & Wright, Continental, Hartford, Dunlop and G & J have long been established here. The Michelin, Dow and Federal are newcomers in the fold here.

It is not to be wondered at that the accessory people are very strongly entrenched in Boston. All the speedometers are represented here; Gray & Davis have just established a Boston office for lamps; the many kinds of shock absorbers have their own representatives, until the owner of a motor car may purchase anything needed and without being forced to go to any one place and held down to one article of some accessory. With all these affiliated branches counted in it proves there are millions in the motor industry in this city alone, just how many is problematical, but \$10,000,000 does not seem an excessive figure.

Statistics From Boston.

Estimated capital invested.....	\$10,000,000
Total sales in 1908.....	\$7,000,000
Cars sold.....	3,500
Makes represented.....	65
Agencies.....	31
Branches.....	14
New branches opened.....	1
New agencies.....	8
Branches discontinued.....	1
Agencies discontinued.....	13
Taxicabs running.....	75
Supply houses.....	52
Miscellaneous concerns.....	45
Garages.....	20

CALIFORNIA APPRECIATES THE AUTOMOBILE

SAN FRANCISCO, CAL., Dec. 26.—“The past season, though a trying one at the beginning, has in the end been one of the best in the history of the motor car industry in California. The season that we are just about to open will, in my opinion, surpass anything that we have ever had out here.

This brief summary, made by one of the prominent motor car agents of this city, gives a good picture of the situation in this State; in fact, it may be applied truthfully to the whole Pacific coast, if reports brought to this city by the general traveling representatives of the manufacturers are correct. Never before has the outlook in this State been brighter for the motor car men. The financial stress has passed away, and money appears to be plentiful, although it is still true people are holding onto it a little nervously. The peculiarly local conditions affecting San Francisco as a result of the great disaster of 1906 are rapidly straightening themselves out; merchants and business men now know where they stand, and are able to judge their affairs accordingly. The agriculturists of the State, and its horticulturists, are much happier than they were a year ago, for the rains have come that were lacking then. The prosperity of these two great industries of the Golden State means the prosperity of all. And, too, the prosperity of the farmer and the fruit man and the man of the country generally assumes an importance this year that it has never had before. The reason for this is the introduction into the motor car market of the new brands of low-priced cars, which will be turned out by the thousands, and which must in the nature of things find a good part of their market in the country. So far as California is concerned, there seems to be no doubt but that the country will do what is expected of it, and maybe demand more than the manufacturers can supply.

Year a Healthful One.

All things considered, the past year has been an excellent one for the motor car men of this city and State. The start was bad indeed, for the financial depression that put itself like a pall over the country in the fall of 1907 affected California no less than it did the East and Middle West. Perhaps, indeed, the effects were felt a little more out here because of local conditions. San Francisco was just pulling itself out of the disaster of 1906 when in May, 1907, came the great street-car strike, which resulted in the temporary destruction of San Francisco's retail business. Just as this was settled and business was resuming its normal course, there came the financial crash that shut the motor car market down as tight as a drum. Those were bad days for the agents who did not have the strongest financial backing, and it was not long before a dozen or more of them closed their doors, some of them able to pay their bills first and some of them not. It was a weeding out of the mushroom firms.

Gradually, however, with the disappearance of the paper money issued by the clearing houses and the return of confidence, things began to brighten, and before the Summer was well along the motor car market was very appreciably improved. The business of the various houses, while not, perhaps, approaching the heavy volume of the previous season, was still sufficient to float the agents along very comfortably, and in some instances cars that have won popular favor have not been obtainable in sufficiently large quantities to meet the demand. For example, Charles S. Howard, the local representative of the Buick car, has been at the factory at Flint, Mich., for several weeks trying to get some more cars for his territory. Finding telegrams availed him nothing, he packed up and went East with the determination to camp right at the factory until he got what he wanted. Meanwhile the floor of his salesroom here is practically empty, and of the particular model that he wants he cannot get enough.

Scramble to Fill Orders.

Other local agents have found themselves practically in the same position. The few companies that had their 1909 models

to show two or three months ago reaped a harvest, while those whose cars arrived late suffered accordingly. Many of them, however, with well-known cars, accumulated a goodly number of orders, and they are now filling these from the shipments that are coming through. California, differing from many sections of the country, is a year-around State. There never is a week that motoring is not pleasant, and for business purposes the motor car is used every day in the year. This is especially true in San Francisco, where the transportation companies have not yet entirely straightened themselves out after the disaster, and getting about rapidly is consequently still a little slow. Motor car buying in California, therefore, never stops for weather reasons. The coming season certainly will be no exception. The reports of the motor vehicle department of the secretary of State's office show that from December 1, 1907, to the same date this year almost 5,500 individual motor vehicle licenses were issued.

Fine New Buildings.

The great fire of 1906 destroyed every motor car salesroom in the city. Since that time practically every dealer in the city has had his salesroom in some kind of a temporary shack, paying exorbitant rates of insurance and constantly in dread of fires, several having been wiped out by flames. This situation is now being remedied rapidly. The Winton Motor Carriage Co., when it established a branch here a year ago, put up a handsome brick and concrete building on beautiful Van Ness avenue which not only houses its own branch, but also two other motor car firms and a tire house. This building cost about \$65,000. The White company is now erecting what will undoubtedly be one of the finest garages and salesrooms in the city. It covers a large area, with two stories, and will cost more than \$125,000. The Studebaker Brothers Co., of California, has erected in the general wholesale district of the city a seven-story building that must represent an investment of a third of a million.

The Franklin and Pope-Hartford agencies, the Fisk Rubber Co., the Renault, the Oakland Motor Car Co., the Winton and the Diamond Rubber Co. are all now housed in permanent structures, and contracts have been let for several other fireproof buildings, each one of which will house two or three or more motor firms. The building of the Diamond Rubber Co., in the down-town wholesale district not far from the Studebaker house, is an enormous place, representing a very large investment.

Foreign Car Succeeds.

An interesting feature of the San Francisco market has been the success scored by the only foreign car represented here. This is the Renault. A branch was installed here just about a year ago by Paul Lacroix, head of the firm in the United States, and left in charge of a young French ex-army officer, Rene Marx. During that time the branch has sold more than a dozen of the high-grade foreign machines, the purchasers being numbered among the wealthy men and women of the city. In some cases the car has been purchased here and delivery taken in Paris, the new owners touring the continent before returning here. A taximeter cab company has been organized which has already contracted for a number of Renault taxicabs, and it is understood that these will be in actual service within a month. San Francisco at the present time has no taxicab service, and there seems to be no doubt that if the financiers of the project can see their way clear to impose moderate charges, the little cabs will be immensely popular here. Another taxicab company, it is understood, is also in course of organization which plans to use the Thomas taxicab, which car is well known on the "Coast."

Statistics From San Francisco.

Cars sold in California.....	5,500
Number of branch houses in city.....	8
Number of motor car dealers.....	26
Number of makes of cars represented.....	36
Number of tire agencies.....	14
Number of supply houses.....	10

AUTOS ARE A NECESSITY IN THE NATION'S CAPITAL

WASHINGTON, D. C., Dec. 28.—There are a number of things that serve to make the year 1908 the most remarkable in the history of the local trade. While the number of cars sold probably was not as great as during the preceding year, the average cost of this year's cars was greater than last year, demonstrating that the demand has been for the high-priced machines. Another striking feature of the year's progress was the unusual number of new agencies that were placed during the year, and especially during the latter part of the present season. Sixteen different makes of cars that have not heretofore been represented on this market were placed with different dealers during the year, as follows: Matheson and Oldsmobile, Pope Automobile Co. of Washington; Brush and Oakland, Brush-Nicho's Co.; Stoddard-Dayton and Babcock, L. P. Dorsett Co.; Lozier and Detroit, Dupont garage; Woods H. Cornell Wilson & Brother; Overland, Dewey garage; Premier, Lester D. Moore, Jr.; Chalmers-Detroit, Motor Car Co.; E-M-F, Studebaker, Commercial Automobile and Supply Co.; Regal, George W. Wells. The Luttrell Co. discontinued the Locomobile agency, which was taken by the Belmont garage; the Dupont Garage Co. dropped the Corbin; H. Cornell Wilson & Brother gave up the Elmore agency, which Charles E. Myers took up. This is believed to be about all the changes that occurred during the year.

There are nineteen dealers in the capital city who handle forty-one different makes of cars, thirty-four of which are gasoline and seven electric. It is difficult to figure the amount of money invested in buildings for sales rooms, garages, etc., but it has been estimated at \$2,000,000.

Electrics Hold Their Own.

Electric vehicles about held their own during the year, although during the fog end of the season the demand for them

was greatly improved. Incidentally it might be mentioned that 1909 promises to be the best year for electrics that the local trade ever has known.

Commercial cars made great strides during the year and this branch of the business is receiving more and more attention at the hands of the dealers, as they are beginning to realize that commercial cars are reaching a point of perfection that insures them a steady and ever-increasing sale. The Federal Government is paying a great deal of attention to the commercial car, and the number owned by Uncle Sam has been considerably augmented since the beginning of the year.

New Garages Built.

Half a dozen new garages were erected during the year and this branch of business is rapidly getting down to a more solid business basis. In former years the garage business was deemed a losing venture in Washington, but this was largely due to the fact that the business was not watched closely enough. There were numerous drains that served to swallow up the profits, but this condition of affairs is being rapidly improved and the garage business may now be said to be on a pretty good basis.

Taxicabs were placed here for the first time this year and they leaped into instant favor. At least a hundred of them are now plying the streets, with every indication of a shortage, and it will be difficult to say just how many more would fill the demand.

Statistics From Washington.

Number of motor car dealers.....	19
Makes of gasoline cars represented.....	34
Makes of electrics represented.....	7
Approximate number of cars sold in 1908.....	275
Number of tire agencies.....	19
Number of supply houses.....	2
Number of dealers handling supplies.....	6
Approximate capital invested in all branches of industry, including garages	\$2,000,000

DENVERITES BELIEVE IN PRESENT AND FUTURE AUTOING

DENVER, COL., Dec. 27.—Name for me a city in the United States of America with a population of 240,000 whose people expended more than two and a quarter million dollars for motor cars during the year 1908, then Denver will take second place in that class. Denver did that, and more. Like every other modern innovation that means progress and betterment of mankind, Denver has taken hold of the motor car with a vim, and having the wealth behind it, the result is going to be that it will never be distanced in the number of cars that will be used nor in the average value of these cars.

It took 1,550 cars—gasoline, steam and electric motors—to satisfy the demand of its citizens. The number is going to be far greater during 1909, for the great agricultural district, growing greater every year, and the mineral, oil and other resources of the State and the contiguous territory of which Denver is the center, expanding with astonishing rapidity, is going to pour into the banks of this city such a flood of the purchaseable necessity that the business of the motor car dealers here will be an enviable one.

Fifty-eight Makes Represented.

Thirty-one agencies of motor cars presented fifty-eight different makes of machines for the choice of the purchasers. These dealers—including two branch houses—sold a total of 1,550 cars for an approximate amount of \$3,250,000. Of the totals Denver alone took two-thirds of the cars and expended seven-tenths of the purchase price. The balance went over the State and to other sections taken care of by the agencies and branches. Of the total of 1,270 gasoline cars sold the price ranged from \$650 to \$8,000. About 36 per cent. of the sales were of cars ranging in price from \$1,200 to \$1,500.

The operators and owners of some thirty-odd public garages have each a large force of men steadily kept on the payroll. At these places the majority of the cars are kept, the new private garage at the residence of the owner not having grown very extensively, rather has it been a change of the former horse and carriage house into a garage, and these changes have been numerous, adding much to the health and cleanliness of the residence sections particularly.

While Denver has been a splendid patron of the motor car made in various sections of the country, it is crowding this avenue of progress some by coming in with two factories of its own. One, a gasoline motor car, the Colburn, had its first of sales to record this year.

Fritchie Electric Made in Denver.

The Fritchie Automobile and Battery Co. product, one of which recently completed a run from Lincoln, Neb., to Washington, D. C. This factory filled orders for sixty-five cars during the year, more than half of which have been delivered to Denverites and the balance distributed from the Atlantic to the Pacific. These two factories show a capital investment of \$300,000, and this added to the moneys invested in the agencies, the branches—Studebaker and Ford—the garages, the supply houses, tire agencies and motor car livery establishments, bring the grand total invested in the industry up to a million and a half.

Statistics From Denver.

Capital invested	\$1,500,000
Cars sold in 1908.....	1,550
Number of agencies.....	31
Different makes represented.....	58
Number of tire agencies.....	13
Number of supply houses.....	3
Number of public garages.....	30
Number of factories.....	2

CLUBS PREPARE FOR WORK OF NEW YEAR

QUAKERITES DON'T WANT CLEAN SCORES.

PHILADELPHIA, Dec. 28.—So many "unofficial" wails have arisen over the impossibility of covering the mountain controls of the New Year's endurance run of the Quaker City Motor Club on a 20-mile-an-hour basis, that the contest committee last week "unofficially" discussed the situation and decided, again "unofficially," to pay no attention to them, on the ground that all would suffer alike, and that the committee didn't want a superfluity of clean road scores anyway. At the same time, as a matter of justice, it was decided, in view of the extremely narrow road, especially in the mountains, that if a sound car is held up by a broken-down car at one of these narrow places and can't get around, the observer shall "take time out," which will be allowed in reckoning up penalties at the end of each day.

Since last week's heavy snowstorm, there have been many misgivings over the situation, and not a few entrants have sent their cars over the route. Two of them, the Acme and the Stoddard-Dayton, went over the first day's route to Wilkes-Barre and were forced to "buck" drifts for miles on that portion from Stroudsburg to within a few miles of Wilkes-Barre. They were nearly twelve hours on the road and, had the contest been on, would have accumulated upward of 200 demerits each. Another storm before the start will make things decidedly interesting to cars and occupants alike, although the members of the Monroe County Automobile Association have volunteered to get out and break the roads in such an event.

Twenty-four cars have been entered up to date with two days' mails yet to hear from. They are: Stoddard-Dayton, Matheson and Mitchell, three each; Winton, Franklin, Maxwell and Cadillac, two each; Peerless, Acme, Studebaker, Elmore, Oldsmobile, Buick and Rambler, one each.

Over the "automobilists' midday lunch" at the Walton there have been many challenges and acceptances for dual combats between various cars, until on Friday last, Manager W. C. Longstreth, the local Maxwell manager, posted \$500 and issued a defi to any other entrant of a \$2,000-or-under car who thought his machine would total fewer penalties than the Maxwell to cover the amount. The Automobile Sales Corporation, which entered the Cadillacs, has accommodated Longstreth, and there is at least one other that will follow suit.

DENVER MOTOR CLUB IS PROSPERING.

DENVER, Dec. 28.—Two agreeable surprises were sprung upon the members of the Denver Motor Club at the annual meeting when President Ralph W. Smith announced that a downtown clubhouse and also a country clubhouse had been secured for the coming year. The downtown club is at 1407 Cleveland place, and possession of this house was taken the day before Christmas. The new location is an ideal one for a motor club, as it is convenient to the business part of town, and the clubhouse being situated where four streets converge, the members will have ample space to park their cars while visiting the clubhouse. It is also only a short distance from Broadway, which is the automobile row of Denver, and garage facilities will be ample. In addition to these new club quarters, the members of the Denver Motor Club will be granted all the privileges of the clubhouse at Overland Park, seven miles south of Denver.

With these two clubhouses the Denver Motor Club will be in a position to entertain the Glidden tourists next Summer in a befitting manner, and already preparations are being made.

The annual election of officers for the ensuing year was as follows: President, Ralph W. Smith; vice-president, William D. Nash; secretary, Frank England; treasurer, C. P. Allen; board of governors, S. D. Hopkins, George Tritch, J. Nicoll Vroom, E. F. Dean, Ralph L. Taylor, W. H. Sharpley, and the above mentioned officers.

BUFFALO CLUB WORKS FOR MEMBERS.

BUFFALO, Dec. 28.—The annual election of officers of the Automobile Club of Buffalo resulted in John M. Satterfield being named as president; Laurens H. Enos, vice-president; Harry Thorpe Vars, treasurer, and Dai H. Lewis, secretary. Mr. Satterfield was vice-president and chairman of the Good Roads committee of the club last year.

The report of the retiring president, Frank B. Hower, showed that the expenditures of the year had been heavy, including the promotion of the boulevard from Buffalo to Niagara Falls, and also in connection with fighting the proposed municipal ordinance taxing automobiles \$5 a year; \$565 of the club funds were swallowed up in this and \$534.83 was expended in surveying and planning the boulevard. An additional \$315 went toward starting the club bulletin.

The membership to date was reported at 1,525, a gain of 398 during the year.

The grievance committee reported that of the 66 arrests for speeding during the year only seven were members of the club.

The boulevard committee submitted a report declaring for the laying out of a boulevard from this city to the Falls, starting at Delaware Park and continuing along Ellicott creek, the Erie canal, Sawyers creek, Bergholtz creek and Cayuga creek, terminating opposite the Niagara Power Company's plant. A committee of five lawyers has been appointed to draw up a bill to be presented in the Legislature authorizing the appointment of a commission, which will be empowered to create parks and boulevards leading to the State Park at Niagara Falls.

President William H. Hotchkiss, of the A. A. A., delivered an address explaining the work and aims of the National organization.

Retiring President Hower was presented with a cut glass punch bowl by his fellow members.

CAMDEN, N. J., NOW AN AUTO CLUB CENTER.

CAMDEN, N. J., Dec. 28.—One of the most enterprising automobile clubs that the State of New Jersey can boast is the new organization known as the Camden Motor Club. Its membership is now close to fifty and every member is a hustler, the work of posting all the principal highways in the western part of the State now being carried out rapidly, while the club will also lend every effort toward the passing of more favorable legislation this Winter. The custom of a carrying a large letter C on their cars has been adopted by the members, and the club is beginning to make its influence felt to a constantly increasing extent. The officers are: President, Dr. H. H. Grace; vice-president, William L. Hurley; secretary and treasurer, G. E. Rhedemeyer. The law committee is composed of the Hon. J. Willard Morgan, Norman Grey and John O. Wilson, while the highway committee is composed of J. T. Dorrance, Frank L. Starr and Harry E. Bodine.

A. C. MARYLAND WANTS GARAGE TIMING SYSTEM.

BALTIMORE, Dec. 28.—Unless Baltimore garage proprietors put in proper timing systems, the Automobile Club of Maryland will propose a city ordinance compelling them to do so. This action on the part of the club members was taken in consequence of numerous instances of "joy riding" and the taking of cars by chauffeurs without the consent of owners.

The club, by resolution, commended Oscar G. Murray, president of the Baltimore & Ohio Railroad Company, for his prosecution of James L. Hild, his chauffeur, who took out Mr. Murray's car without consent. The ride, as stated, ended in the death of one of the riders and the smashing of the machine.

Accidents in Baltimore recently have been entirely too numerous, and the public is inclined to class innocent with guilty.

MASSACHUSETTS COMMISSION SUPPLIES STATISTICS

BOSTON, Dec. 28.—Before deciding to recommend to Massachusetts and the New England States for adoption as a part of a uniform automobile law, a graded scale of registration fees based on horsepower, the Massachusetts Highway Commission made some very careful calculations of the relative cost of registration, liability insurance and tires. The horsepower plan was adopted as the best measure which would represent cost, speed and weight, or the wearing effect of an automobile on the roads. As the registration fees go into the State treasury for use in road maintenance, each fee represents the contribution of the automobilist towards good roads, which are perhaps the most important item in his enjoyment of the motor car.

Looking at it in this way the commission has figured out that on a horsepower basis the automobilist will be required to pay for good roads only less than one-fourth what he pays for liability insurance, which is also graded according to the horsepower of the car, and one-tenth what he pays for tires. Furthermore, by contributing to the improvement of the roads the motorist will greatly reduce his tire cost. The commission has compiled detailed figures on this subject and has found that for a 10-horsepower car the registration fee would be \$5, the liability insurance cost \$32 and the tire cost \$71.44. On a basis of 3,500 miles traveled, the average life of a tire, the commis-

sion figures the cost of registration for a 10-horsepower car at .0014 cents a mile, of insurance at .0091 cent a mile and of tires at .0204 cent a mile. On a 5,000-mile basis, the maximum life of a tire, the figures are .001 for registration, .0064 for insurance and .0143 for tires. For a 40-horsepower car the registration fee is figured at \$20, the cost of liability insurance \$80 and the cost of tires \$198.58. The relative cost per mile on a 3,500-mile basis would be .0057 for registration, .0228 for insurance and .0557 for tires. On a 5,000-mile basis the corresponding figures are .004, .0160 and .0397.

The commission also has some interesting figures to back up the inclusion in the new law of the Massachusetts plan of investigating accidents and punishing reckless and other improper driving. These figures show that last Summer there were 18,000 automobiles registered in Massachusetts and in the three Summer months there were 280 collisions in which automobiles were concerned. Although the number of accidents was larger than for the corresponding period of 1907, the number of people injured was one-third less, the figures for 1908 being 222 against 313 for 1907. The number of fatalities was reduced more than two-thirds, the figures for 1907 being 41 against 13 this year. This, the commission concludes, shows a reduction in reckless driving in Massachusetts.

THE LINCOLN MEMORIAL HIGHWAY.

YORK, PA., Dec. 28.—That the Lincoln Memorial Highway bill fathered by Congressman D. F. Lafean, of York, may pass Congress at its present session is the belief of Senator Philander C. Knox, who presented the measure in the Senate. Mr. Knox is greatly interested in the proposed improvements. He stated that he had talked with a number of Senators about the project, and finds a surprising sentiment in favor of it. This is by no means confined to the Senators in the States in the region through which the proposed highway would pass. Senators in the far West have told Mr. Knox that they are for the bill and would like to see it become a law.

In the case of the proposed highway from Washington to Gettysburg, strong reasons of sentiment give the project support.

GOOD ROADS AND AUTOS, BCON COMPANIONS.

TRENTON, N. J., Dec. 26.—The report of Road Commissioner Frederick Gilyson to the Governor to-day will be of interest to autoists in view of the great fairness of his contention, that while automobiles rip up the road, they influence for good roads in a manner that cannot be denied. The report goes on to say that despite the advanced state of road building, it is far from perfect, and experiments now going on in Jersey will have much to do with the future of road building. In repair work the Commissioner points out that too much care cannot be taken to "scarify" the road after it is resurfaced, and he insists upon the removal of all foreign substances before adding new stone. After the stone is applied it is then important to apply a competent binder before tolling.

GRAND PRIX OF FRANCE SEEMS TO BE DOOMED

PARIS, Dec. 24.—Thirty-three cars are needed, and needed within the next week, to make the French Grand Prix possible. At present the total entries are seven in number, the cars supplied being one Guillemin Le Gui, three Cottin-Desgouttes and three Mors. The Porthos has given intimation that three of their cars will be entered, but until the cash is forthcoming the Sporting Commission refuses to take any notice of the entry. Thirty-three cars never have been obtained within seven days for any European race, and it is absolutely certain that the number will not be forthcoming for the 1909 speed test originally scheduled for the month of July in Chateauland. So poor are the prospects that the Anjou committee, which undertook to raise a subvention of \$20,000, has given intimation that those having contributed to the amount should carefully preserve their receipts in provision of a reimbursement.

It might be imagined that as the Grand Prix is a considerable source of profit to the club, there would be an effort on the part of the organizers to maintain it. But no intervention of this nature is likely to be found, for the simple reason that the club and the car builders are one and the same person. The eight members of the Racing Board represent six of the French firms

having the greatest interest in and being the strongest supporters of racing; with these having unanimously decided to abstain from racing, there is no hope of the Grand Prix being carried through.

It has not yet been decided what will be done with the other races announced in various parts of Europe, the most important of which are the Ardennes in Belgium and Brescia in Italy. The probability is that they will all have to be dropped for lack of entries, and that 1909 will thus be a sportless year, so far as Europe is concerned. England finds it utterly impossible to hold a race; Germany has no pretensions towards a speed test; Italy would like to repeat the Brescia events of this year, but will find it exceedingly difficult to do so with no large firms building cars; Belgium announces its Ardennes meet, but has so little hope of securing entries of genuine racing cars that arrangements have already been made for replacing the speed test by a touring car competition. As the aeroplane will come prominently before the public as a sport during the year 1909, it is very probable that when automobile constructors come back to road races in 1910, as promised, there will be nobody to take any interest in their performances.

PERCY OWEN, BRIARCLIFF CHAIRMAN.

In the opinion of those interested in racing, there is now probability that a second race for the Briarcliff trophy will take place next Spring in the vicinity of New York City. On Monday last a meeting of the committee of manufacturers interested in the event was held, at which Percy Owen, well known as one of the pioneer drivers of racing cars, was selected as the chairman. It is understood that C. F. Wyckoff, the temporary chairman, asked to be relieved of his duties.

Sidney B. Bowman, Joseph S. Josephs and H. A. Lozier have been designated as a finance committee, and the Wagner-Field Company will take care of the secretarial work.

Of the eleven representatives present at the meeting, seven definitely announced their intention of entering at least one car in the contest. As to whether the rules have been definitely and finally decided upon without any further revision will await the decision of Walter M. Law, the trophy donor, as to his consent in making the event for what must be considered restricted racing cars, instead of touring cars as originally planned.

LATEST RULING OF COLLECTOR OF CUSTOMS.

WASHINGTON, D. C., Dec. 28.—The Collector of Customs at New York has been advised that the regulations of the Treasury Department of November 27, 1907, providing for the allowance of drawback on automobiles manufactured by Brewster & Co., of New York, with the use of imported parts and materials, have been extended to cover the exportation of automobiles manufactured by the members of the Association of Licensed Automobile Manufacturers, with the use of imported parts, in accordance with their sworn statement, dated September 23, 1908. This statement is now on file in the office of the Collector, together with a list of the members of the association.

The regulations provide, however, that no drawback is to be allowed on horns, lamps, odometers and other attachments which may be readily detached from the automobile, and which do not form a permanent part thereof.

LATE NEWS FROM TIRETOWN.

AKRON, O., Dec. 28.—The new tire on which Frank A. Seiberling, of the Goodyear Tire & Rubber Company, has been granted, is described as a sort of hybrid between a solid and pneumatic. It is designed to be used on both pleasure cars and trucks, and will be constructed in different sizes and thicknesses. The air chambers of the tire will extend laterally across the tire from side to side and will contain air at normal pressure. The walls will be thick and heavy. The advantage of this tire is to afford the resiliency of a pneumatic with the firmness and freedom of a solid tire. The new tire has not yet been placed on the market, but manufactured for experimental purposes only.

A new tire manufactured by the Buckeye Rubber Company and marketed by the Consolidated Rubber Company, of New York and Akron, is being exploited through one of the most extensive advertising campaigns ever undertaken. The new tire bears the same name as the solid and cushion tires previously manufactured by the same companies—the Kelly-Springfield. The tire is made in three standard types, with the flat, round, and Bailey treads.

The Goodyear Tire & Rubber Company is pleased over the result of the long distance run of Oliver P. Fritchie in an electric of his own make from Denver to New York in 30 days' time. Fritchie averaged 100 miles a day, and his machine was equipped with Goodyear long distance electric tires, a type which the company has had on the market a year, and which is designed to consume as little current as possible. Fritchie had one puncture in Chicago, but drove the other three tires the entire distance, arriving in New York with Denver air.

O. L. Weaver, formerly of the Cincinnati branch, has been placed in charge of a new branch established at Atlanta, Ga., by the Goodyear Tire & Rubber Company.

ROSY FACTS ABOUT THE T. C. F.

PARIS, Dec. 15.—Three years ago the membership of the Touring Club of France was 98,000. At the annual meeting held in Paris last week President Ballif declared that the figures had now mounted up to 115,000, the largest number of any similar club or association in the world.

The income for the year had been \$221,718, and the net balance in hand on the year's work no less than \$37,353.

During the past two years a total of \$2,400 has been given in subventions toward the construction of paths for cyclists in the neighborhood of Paris, and \$6,000 have been contributed to the work of repaving the main roads leading out of Paris. This task has been undertaken by the government at a total cost of \$600,000, with financial aid from the Touring Club and the Automobile Club of France. When completed the present roughly paved highways out of the capital will have been replaced by perfect smooth granite-paved roads suitable for heavy automobile traffic, and giving easy access to every part of France.

The club awarded its gold medal to Henry Farman for the first cross-country flight by aeroplane, this being, in their opinion, the most important action of the year tending toward the development of travel. One of the 115,000 who had written a violent article against the automobile was held up to scorn.

FIGURES AUTO CHEAPER THAN HORSES.

A Western man, T. H. Proske, whose farm is near Denver, Colo., and who travels daily to the city, decided to test the expense of an automobile as compared with horses for this use. He bought a 28-horsepower Franklin, and after 18 months' use compiled these figures, based on a daily average of 35 miles:

One set of tires.....	\$130.00
Less credit for old on taken in exchange.....	35.00
	<u>\$95.00</u>
One overhauling and varnishing.....	35.00
Average cost of gasoline, oil, and batteries per month, \$12; 18 months.....	216.00
Original cost of motor car.....	3,040.00
Total	<u>\$3,386.00</u>

Selling the car for \$2,250 cut the cost down to \$1,136, or a little more than five cents per mile.

Being satisfied that the first cost of horses and carriages would exceed the cost of the machine, he figures the upkeep as follows, making no allowance for repairs, depreciation or death of horses:

Feed for two horses per month, \$35; 18 months....	\$630.00
Coachman, boarding himself, per month, \$75; 18 mos	1,350.00
Total	<u>\$1,980.00</u>

"It will be seen," he says, "that even if there was no sickness, death or depreciation I am still \$844 ahead."

This result is reached by deducting from the \$1,980, maintenance of a carriage, the \$1,136 which the automobile actually cost for 18 months. The cost of upkeep of a new 42-horsepower automobile does not exceed by more than 10 per cent. that of a 28-horsepower machine.

FARMERS LIKE DETACHABLE TONNEAU.

GRAND RAPIDS, Mich., Dec. 21.—Western Michigan dealers expect to push hard this coming season the sale of delivery autos to farmers. Grand Rapids is in the center of the fruit belt, and is already famous as a market. More than 50,000 bushels of peaches have been sold by farmers in a single day since the new market was built, many of the farmers making one or more or as many trips as they can a day. Owing to the necessity of handling their crops with rapidity, the more progressive farmers are adopting automobiles, and so many inquiries are coming into the manufacturers now for delivery cars that many of them have demonstration cars in the city now and are making frequent demonstrations to farmers who will be in the market in the spring. The detachable tonneau car, the dealers declare, made to sell for from \$1,200 to \$1,600, seems to be the most in demand for this sort of use.

BALTIMORE DEALERS WELL SATISFIED.

BALTIMORE, Dec. 28.—While the tightness of money during the early months of 1908 had its effect upon the local automobile trade, most of the dealers announce that their business during the past twelve months has been at least as good, if not better, than during 1907. The last three months have been splendid ones, and they predict that 1909 will undoubtedly be the banner year for the sales of cars in this city and throughout Maryland.

There is every reason to expect this prediction to be realized, for horseless vehicles are becoming more and more popular here every week. Then, the General Assembly of Maryland has appropriated \$5,000,000 which will be used for improved highways in the State; the voters of Baltimore will cast their ballots for or against a \$5,000,000 paving loan either next spring or at the following fall election, while a \$2,000,000 annex paving loan is being utilized at present for improving the thoroughfares on the outskirts of the city. All of these things are favorable for the increase in the number of automobiles in this city in the near future.

Baltimore has not been much of a field for commercial cars in the past, but these, too, are gradually making inroads. Several of the breweries, wholesale drug companies and other large business houses have put gasoline trucks into service. A number of the department stores, too, are testing electrics for delivery purposes, and these trials have been successful.

A new factory has recently opened up in Baltimore. This is the Carl Spoerer's Sons Company, who are making various types of Spoerer cars. This makes two factories now located here, the other one being the Sinclair Scott Company, makers of the Maryland car.

Licenses have been issued for 1,701 cars from January 1 to December 1, 1908. Forty-one of these were issued in January; 42 in February; 111 in March; 164 in April; 133 in May; 323 in June; 183 in July; 185 in August; 187 in September; 201 in October; 131 in November.

BIG TAXICAB PROFITS IN NEW YORK CITY.

NEW YORK CITY, Dec. 28.—A pamphlet issued by one of the local taxicab companies for private distribution among possible investors, shows that the present profits from the cab service are enormous. This pamphlet showed first that an estimate of an income of 45 per cent. is ultraconservative. The pamphlet goes on to say: "Our own records show that the cabs average 45 miles per day, with two and a half hours' waiting time chargeable to patrons, giving an average gross receipt of \$22 per cab per day."

On basis of \$22 per day, 360 cabs will earn per year.....	\$2,890,800
Tire charges on this basis.....	\$162,607
All other charges, including depreciation.....	448,560
Chauffeur's 20 per cent. of earnings.....	578,160
	<hr/> \$1,189,327

Available for dividends	\$1,701,472
-------------------------------	-------------

This figures out 113 per cent. profit. The pamphlet continues with the statement that the chauffeurs being paid entirely on a percentage basis, only \$4.55 per cab per day need be earned in order to pay all expenses and lay aside 25 per cent. for depreciation, so that all above this amount is available for dividends.

FRANKLIN'S ALCOHOL MOTOR CAB.

NEW YORK CITY, Dec. 28.—The agitation of the past year relative to the use of alcohol as a fuel culminates very properly in the production of a motor cab with an engine designed and proportioned for the use of alcohol fuel exclusively. This latest product of the H. H. Franklin Mfg. Company, of Syracuse, N. Y., while not differing in appearance from other 18-horsepower Franklin cabs, has a high compression and a special carburetor to allow the engine to make use of this fuel, which is slower burning ordinarily, but when highly compressed, say to 100 pounds per square inch, burns rapidly enough for a motor speed of 1,000 r.p.m.

GENERAL MOTORS COMPANY AN ACTUALITY.

LANSING, MICH., Dec. 28.—The fact that the General Motors Company, incorporated for \$12,500,000 in New Jersey last week, is not alone a reorganization of the Olds Motor Works, but also includes the Buick interests, has led to a renewal of the rumor of a general combine of the producers of low-priced cars which first had its origin last Summer. When talk of the Buick entering the new combine was first heard, it was vehemently denied, but when seen in Detroit to-day, W. C. Durant admitted that "If the report comes from an authentic source, it must be so." Frederick L. Smith, general manager of the Olds Works, states that the change will not affect the business of his company in any way, except that it is anticipated that the merger will enable the product to be marketed more economically, and that the volume of business will be increased. "The Olds Works are now in the most prosperous condition they have ever been in, employing the largest number of men in their history," said Mr. Smith.

The fact that the capitalization of the General Motors Company, divided into \$7,000,000 cumulative preferred, and \$5,500,000 common, is to be issued in shares of a par value of \$1, shows that it is for "popular consumption." One of the promoters is said to be Curtis R. Hathaway, an associate of Ward, Hayden & Satterlee, a New York firm of lawyers, who are reputed to have been connected with rumors of several motor mergers in the past that involved Wall Street financing, but regarding which no definite information was ever obtainable. At one time or another, the name of practically every producer of low or medium-priced cars has been mentioned in connection with the merger, but nothing tangible has ever developed except now where Buick and Olds are involved.

WOMEN'S NEW YORK-PHILADELPHIA RUN.

One of the latest publicity promotions is that of a women's run from New York to Philadelphia and return, scheduled to take place in the near future. Originally intended for this week, the condition of the roads brought about a postponement, with the probable dates during the week of January 10. The list of participants is announced to include several of the fair sex who have demonstrated their ability at the wheel. Entertainment is to be supplied at Newark, New Brunswick, and Trenton on the way to Philadelphia, where the Hotel Walton will be the official stopping place. The return journey will include a run across Staten Island, with courtesies extended by the Richmond Country Automobile Club. A statue of Galatea is among the prizes to be awarded for the most proficient performers.

REVIEWS OF LATE BOOKS.

Motor Car Mechanism and Management.—This book, by W. Poynter Adams, is the second part of a work, the first installment of which deals with gasoline vehicles, while that under review is devoted entirely to electrics and "petrol electrics," this being the Britisher's term for the combination gasoline-electric vehicles that are now receiving considerable attention abroad. It treats of the subject from an elementary point of view and after giving the basic principles of electrical action, goes on to describe the various parts of an electric car and their functions, this being supplemented with chapters on the care and management of each essential of the vehicle. Besides this some types of British electrics and combination cars are illustrated and described. The J. B. Lippincott Company, Philadelphia, are placing the book on the market in this country.

A Manual of Oil Motors and Their Uses.—The author of this work is G. Lieckfeld, and it was originally published abroad, the J. B. Lippincott Company, Philadelphia, issuing it in this country. It is a résumé of past achievements, and presents uses of the internal combustion motor, trather than a work on design, showing the development of the automobile and marine motor from its inception, as well as the development.



News in General

The Premier in the Shadow of Mount Hood.

Through the mountains of Northern Oregon the roads are changeable and frequently quite difficult, but there are compensations in the rugged magnificence of the scenery.

Dayton After Detroit's Laurels.—The number of automobile firms in Dayton, O., has recently been augmented by the addition of the Lexington Motor Car Company, with a capital stock of \$50,000. This concern will turn out a high-grade four-cylinder car of five and seven passenger capacity in both touring and runabout styles, to sell at from \$2,500 to \$3,000. Work has been started and material contracted for, so that deliveries may be made within a short time of the first of the 250 cars to be built in 1909. The company has as one of its stockholders Fred N. Coats, who left the position of assistant salesmanager of the Dayton Motor Car Company to act as secretary and general manager.

Rambler Gets Record.—Probably the most frequently broken and one of the most coveted records in the West is that between Los Angeles and San Diego. Recently this honor changed hands once more when the Rambler fractured the mark previously held by the six-cylinder Franklin. In so doing L. B. Harvey gained possession of the coveted Chanslor and Lyon trophy for the second time. The distance between the two cities and return is 320 miles, and this distance was made in 10 hours 32 minutes, which is 45 minutes better than the old mark. Ralph Hamlin, the Franklin man, announces that he will go right after the new mark.

Rapid Makes Big Addition.—The Rapid Motor Vehicle Co. of Pontiac, Mich., has recently completed two additions to its plant which will nearly double the present facilities. One of these is a new third story added to the office building, adding a space 60 x 80 for administration purposes. Besides this a new steel and concrete structure 60 x 300, two stories high, has been added to the machine shop. When the machinery is installed the present force of 275 men will be fully doubled.

Herz & Company to Move.—Herz & Company, New York City, are about to remove their office and factory to the Puck Building, 303-305-307-309 Lafayette street and 35-37 Houston street, where they will occupy the ground floor now being fitted up to suit their requirements. The new quarters will have double the floor space of the present factory and will be equipped with the latest machinery and devices for the manufacturing of automobile supplies.

A Mitchell Put to a New Use.—Who ever heard of the automobile as the advance agent for a railroad? Sounds rather unique, but that is about the work which was cut out for a Mitchell recently in Texas. The *San Antonio Light* was pushing a new railroad in that section and sent a party out in the car through a part of the country entirely new to such mode of travel. They covered over 250 miles and returned after two weeks with bonuses of over \$800,000.

Still Another Aeroplane Enthusiast.—Among the latest additions to the ranks of the aerial navigators is Lewis Strang, who has been engaged by J. H. Tyson to make a trip to France, where he will receive instruction in the latest flying methods. It is reported that an aeroplane of the Delegrange type has already been purchased and Strang is to bring it back to America if his lessons at the new game are successful.

Mason Enlarges.—The Mason Motor Car Co. of Des Moines has been reorganized with a capital of \$250,000 and the factory capacity will be doubled. The company will hereafter be known as the Mason Automobile Company. A local banker, A. B. Shriver, is prominent in the new company, but E. R. Mason will remain as salesmanager and F. S. Dusenbergs as superintendent.

Changes on the Coast.—George W. Shugars, former manager of the Durocar Company's factory on South Los Angeles street, Los Angeles, Cal., has resigned as manager and director. For the present W. H. Pendelton will act as factory manager while the duties of salesmanager will be looked after by Walter Sahland.

Columbia Works Running Full Blast.—It will surprise many to know that the Electric Vehicle Company, Hartford, Conn., has a force of 400 men turning out from three to five of the formerly well-known Columbia cars. These are about equally distributed between the "30" gasoline and the electric phaeton.

Thomas Gets Hurlburt.—It is rumored in New York City that upon the termination of the contract between the E. R. Thomas Motor Co. and the Harry S. Haupt Company, the latter will be replaced by a factory branch in charge of William B. Hurlburt, former president of the Garford Motor Car Company.

Uncle Sam Gets Another Steamer.—The first of the new 40-horsepower Model "M" White steamers to be shipped from the factory was delivered a few days ago to the purchaser, the United States War Department. The car has been assigned for the use of the general staff in Washington.

Medal Awarded Holsman.—As winner of the class A, for motor buggies, at the Algonquin Hill Climb, the Holsman Automobile Company of Chicago has recently received the medal for this event. The design is of silver, framed in green velvet and encased in a green leather box.

IN AND ABOUT THE AGENCIES.

Franklin Agency Appointments.—The H. H. Franklin Manufacturing Company, of Syracuse, N. Y., announces the following new agencies: B. H. Byrne Garage Company, West Pearl street, Jackson, Mich.; Amos Post, Catskill, N. Y.; Seattle Automobile Company, Tacoma, Wash.; Easton Automobile Company, Easton, Pa.; F. F. Morrell & Son, Riverhead, Long Island; L. N. McCarter, Norristown, Pa.; Hugh H. Lewis, Fort Worth, Tex.; E. R. Wilson, Ishpeming, Mich.; Elizabeth Automobile Company, Elizabeth, N. J.; L. B. Russell, Jr., Comanche, Tex.; Corsicana Motor Car Company, Corsicana, Tex.; Charles Denegre, Birmingham, Ala.; H. B. Sproul & Company, Staunton, Va.; N. N. Steffes, Winona, Minn.; W. B. Jernigan, Pine Barren, Fla.

Marion, Indianapolis.—The Marion Motor Car Sales Company, with offices at 238 Massachusetts avenue, Indianapolis, is the name of the new selling concern, organized to sell the entire output of Marion cars, which will consist of three styles, but all using same chassis. The new Marions have 35-horsepower motors and list at \$1,850. B. F. Meixell, for the last eight years with the Fisk Rubber Company, is salesmanager of the new company.

Knox, Philadelphia.—The North Philadelphia Auto Station, 3425 North Broad street, has secured the agency for the Quaker City and adjacent territory of the Knox car. The Knox was formerly represented there through a branch house, and later the Foss-Hughes Company looked after the Knox commercials, but for some time past the company's product had been unrepresented in Philadelphia.

Stromberg Branches.—The Stromberg Motor Devices Company, of Chicago, has opened a branch at 319 Columbus avenue, Boston. It has also appointed the Standard Automobile Company its Pittsburg agents and the Auto Equipment Company agents for Philadelphia and vicinity.

Allentown Changes.—The Hamilton Auto Company, of Allentown, Pa., has absorbed the Hamilton Peatty Company and will open up new sales rooms and a garage on the Rink property. This company already has the Ford agency.

Knox, Chicago.—The Knox Automobile Company, of Chicago, will remove to 1458 Michigan avenue as soon as the necessary repairs can be effected. A five-year lease has been procured on this property.

New Company in New York City.—The Howard & Company Auto Exchange has leased quarters at 1666 Broadway, where it will handle high-grade foreign and domestic cars.

Oldsmobile, Newark, N. J.—The Oldsmobile Company, of New York City, has established a branch at 88 Washington street, Newark, N. J.

Crawford, Newark, N. J.—The Mitchell Automobile Company, Halsey street,

Newark, will also sell after January 1 the Crawford car, made at Hagerstown, Md.

Chalmers-Detroit, Allentown, Pa.—Lawfer Automobile Company, of Allentown, Pa., has taken the agency for the Chalmers-Detroit.

Elmore, Santa Ana, Cal.—D. J. Bastanchury has taken the agency for the Elmore car at Santa Ana, Cal.

White, San Diego.—F. C. Fenner has been appointed agent for the White steamer in San Diego, Cal.

PERSONAL TRADE MENTION.

Kyle Wallace, the former assistant superintendent of the Maxwell-Briscoe Company's plant at Tarrytown, N. Y., has accepted the position of superintendent of the works of the Colburn Automobile Company, at Denver, Col.

J. A. Tuthill, sales agent for the Dayton Airless Tires for New York City and vicinity, has located at 1966 Broadway.

W. E. Knight, formerly with the New York Leather Belting Company, has joined the H. H. Franklin Mfg. Co.

OBITUARY.

Arthur W. Tobin, president of the Continental Motor Mfg. Co., of Muskegon, Mich., died December 13 at the Augustana Hospital, Chicago.

RECENT INCORPORATIONS.

Prospect Heights Automobile Company, Brooklyn, capital \$125,000, to manufacture automobiles. R. L. Kelly, F. F. Reilly and L. C. Howard were named.

West Medford Automobile Company, Medford, Mass., capital \$20,000, to do a general automobile business. President, A. E. Kenney, and treasurer, C. E. Hall.

Morgan Motor Car Company, Wilmington, Del., capital \$500,000. E. L. Squire, K. M. Byrne and J. A. Byrne are interested.

Atlantic Motor Company, Greensboro, N. C., capital \$25,000, to manufacture and sell motors, engines and machinery.

Bell Carbureter Company, 305 Garfield avenue, Aurora, Ill., capital \$12,000, to manufacture auto attachments.

G. H. Dunham Company, Boston, capital \$25,000, to do a general automobile business.

TAXICABS AND TRANSIT.

Motor Railway Cars Replacing Steam. Pennsylvania railroad officials have ordered several Union Pacific gasoline motor cars, one of which will be placed in service on the Indiana branch between Blairsville and Indiana, replacing all other steam-drawn passenger trains. Tests will be made with the others in the Pittsburg district on the main line between Pittsburg and Pitcairn, as well as on the Conemaugh and Monongahela division. If these tests prove the suitability of the cars for this work a number of them will be ordered.

Lansing, Mich.—The fire chief of this city recently tested out the combined automobile fire engine and hose wagon. The test was a complete success, but six seconds being required to start. A speed of 40 miles per hour was shown and a stream of water was pumped 20 feet above a six-story building. The capacity of the machine is 700 gallons per minute.

Atlantic City, N. J.—Louis Kuehnle, Edward Bader, Dr. B. F. Coll, Charles Gondolf and William Harris have formed a company for the purpose of supplying the City-by-the-Sea with taxicab con-

veniences. Twenty machines have been ordered, the first of which arrived last Friday. The company has decided to fix the price basis at 40 cents a mile.

Modesto, California.—A new road in the West running from Modesto to Empire, Cal., has just been completed. This will be known as the Modesto Interurban, and will be operated exclusively by gasoline motor cars. If the service connecting with the Santa Fe at Empire is successful it will be extended to Oakdale, where it will connect with Sierra railway.

Covington, La.—The St. Tammany & New Orleans Railway & Ferry Company has received its first gasoline railway car. This, an open body, 50-passenger car, will be put in service immediately, running to and from Covington, La.

Placerville and Lake Tahoe, Nev.—The stage line between Placerville and Lake Tahoe, made famous by Mark Twain's story of Horace Greeley, is to be brought up to date by the use of motor buses.

Reading, Pa.—A company is in process of formation which will operate a system of taxicabs in Reading. Two of the vehicles are already at work.

Yellowstone Park.—The old stage in Yellow Stone Park is being replaced by a modern Franklin air-cooled touring car.

GARAGE NEWS OF ALL KINDS.

Los Angeles, Cal.—The Los Angeles agent for the Thomas, Rene A. Brassey, operating under the corporate name of Thomas Motor Car Company, has completed plans and started the construction of what will be the finest garage and salesroom in Southern California. This new building, which will be located at 646 South Olive street, will be of pressed brick, 70 by 165, and will cost upward of \$100,000. In addition to this up-to-date building, Mr. Brassey has engaged, among others, Montague Roberts, the famous Thomas racing driver, to assist him.

Wilmington, Del.—A new garage has been opened at Wilmington, Del., by the Wilmington Automobile Company, who will handle the Franklin. The garage building adjacent to the new Avenue Theater at Delaware avenue and Tatnall street, is 83 by 114 and two stories high. The first floor provides machine and repair shop as well as storage space. The second is given up to storage entirely.

Terre Haute, Ind.—John Cox, who retired as manager of the Terre Haute (Ind.) Automobile Company some time ago, will erect a garage at 222 South Seventh street, and under the firm name of Cox & Company will compete with his former employers. A modern building 67 by 100 will be erected.

Omaha, Neb.—The Coit Automobile Company is preparing to build a reinforced concrete garage on the corner of Farnam and Twenty-third streets, in the midst of the automobile district. The building will have a frontage of 72 feet and a depth of 132 feet.

Harrisburg, Pa.—The Central Pennsylvania Automobile Company is reconstructing the building at Fourth and Chestnut streets, Harrisburg, Pa. A fireproof oil and gasoline room will be a feature. They handle Locomobile, Franklin, Oldsmobile, Buick and E-M-F cars.

Bakerfield, Cal.—The Bakerfield Garage Company has purchased property fronting on Nineteenth and Twentieth streets, where it will erect a complete garage and repair shop at an expense of about \$50,000.

Portsmouth, O.—W. J. Friel has just taken possession of his new garage and repair shop at 14 West Fifth street, where he will be able to do a large volume of work of the class that makes for future success.

Fort Smith, Ark.—A new garage has been opened in Fort Smith which will handle the White steamer and Oldsmobile. This is the Ward & Harris Automobile Company, North Tenth and B streets.

Des Moines, Ia.—A syndicate composed of W. J. Riddell, R. R. McCutcheon and R. Parry has recently purchased the property at 1011-1015 West Walnut street for the purpose of building a garage.

Perth Amboy, N. J.—The Perth Amboy Garage Company is moving into its new building on Madison avenue and will soon be ready for business. Alex. Conquest will be in charge.

Orlando, Fla.—B. C. Abernethy, manager of the Cook Auto Company, has just let the contract for a new large garage next to its present location to handle the increased business.

Long Island City, N. Y.—The Packard Automobile Company has purchased land in Long Island City and will erect a large building for a garage, salesroom and repair station.

Scranton, Pa.—The Standard Motor Car Company is building a new two-story concrete garage in Dupont court, which it expects to occupy about the middle of January.

New Haven, Conn.—George W. Curtis, superintendent of the Holcomb garage, New Haven, will erect a new building at Orange and Audubon streets.

Cincinnati.—The Eagle Automobile Company has leased the property at 3139 Reading road, where work will start at once on the erection of a concrete garage.

Redfield, S. D.—E. C. Issenbuth is building a garage which he will rent to T. P. Blaine, who will carry on a garage and automobile supply house.

Farmington, Me.—The F. E. McLeary Company, Farmington, Me., will build a two-story brick and frame garage with concrete floors.

Jacksonville, Fla.—Fred Gilbert has bought the property at the corner of Church and Laura streets and will erect a four-story garage.

Beloit, Wis.—The contract has been let for the mason and concrete work on the new garage for C. Mattison & Son, Fourth street.

Kansas City, Mo.—L. A. Robertson, agent for the Franklin in Kansas City, is erecting a new garage and salesrooms on Main street.

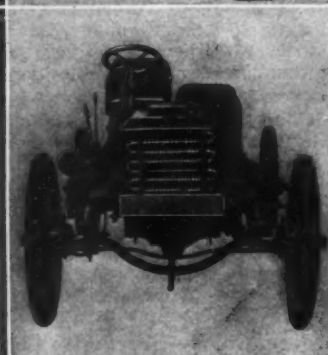
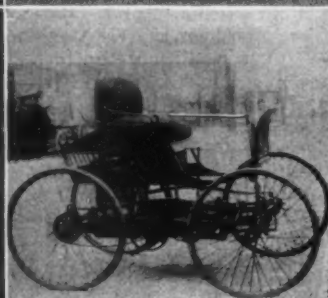
Maywood, Ill., now has a garage, G. T. E. Fuller having recently opened a large building at Lake street and First avenue.



Wilmington's (Del.) Newest Garage.

An Industry's Progress

of a
Decade
by
Thos. J. Fay

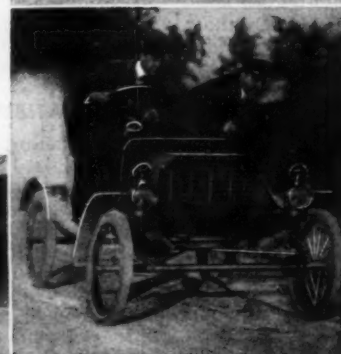
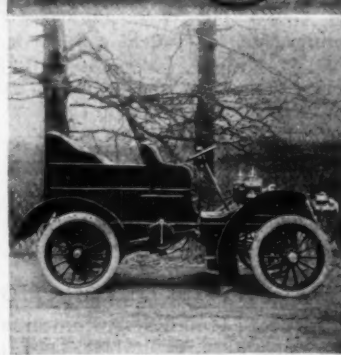


THE mother of invention should be mighty fond of the most youthful of her progeny, the automobile; as well she may. A decade ago the motor-driven car was but the dream of pioneers, out of which they awakened to be smote by the sunlit dawn of a new era. To scan the horizon of human endeavor but a few years ago would have disclosed the automobile as the merest speck, shrouded in mystery, and stayed by prejudice.

It would be to dip deep in the brine of lore, therein to find a theme wonderful in its ramifications, with never a chance of reflecting the splendid possibilities the future holds for this geocentric product, vastly portraying the genius of man.

With an abiding faith in the future of the automobile, considering well the dizzy height attained, the treacherous pathway, and the stragglers that ever bestrew the onward march of progress, it will not be amiss to render up an accounting of the assets, to countermarch that splendid galaxy, and thereby to lend confidence to such further efforts as progress dictates, agged on by necessity.

A résumé of current events, something by way of encouragement, and a stray remark, will scarcely be too much. In the pages to follow, then, the aim will be to discuss the automobile as it is, with perchance a reflection or two portraying the future trend and a resting place for mile stones.



SPECIAL SHOW ISSUE GRAND CENTRAL PALACE, N. Y. PRICE, 25 CENTS

THE AUTOMOBILE

WEEKLY

NEW YORK THURSDAY, DECEMBER 31, 1908 CHICAGO

25 CENTS

McCord

RADIATORS

"ART OUGHT NOT TO BE MADE CHEAP"
Ruskin

Announcement To Lamp and Car Manufacturers.....

We have learned that the Trade name THERMO recently adopted by us for our Searchlight Lens Mirrors conflicts with a trade-mark owned by another manufacturer. We do not wish to be classed as imitators or pirates, because we claim to manufacture a mirror that is superior to other makes. This, therefore, is to make known the fact that our product will hereafter be designated by the trade-mark

S-Q

The S-Q trade-mark is our guarantee that these mirrors will give perfectly satisfactory service.

After many experiments we have succeeded in producing a combination of backing materials which expand and contract in unison with changes of temperature, insuring a permanent mirror with a reflecting surface of unusual brilliancy.

Samples and prices on Stevens Quality Searchlight Lens Mirrors submitted to Lamp Manufacturers on request.

STEVENS & COMPANY, Inc.,

Manufacturers of
Trade S-Q Mark Stevens Quality Optical Goods

PROVIDENCE,
RHODE ISLAND



You Are Invited to Grand Central Palace Show

Mora

MECHANICALLY RIGHT.

Mr. Dealer:

We wish to extend to you a cordial invitation to visit our exhibit at the Ninth International Automobile Show held in the Grand Central Palace, 43d Street and Lexington Avenue, New York City, from December 31st to January 7th (opens New Year's Eve). We will be on the main floor, main aisle, on the 44th Street side, with the finest exhibit of Mechanically Right Automobiles built in the world. We will show the various models and body designs of the cars we are offering for 1909.

MORA MOTOR CAR COMPANY

Broadway and 52d St.
NEW YORK CITY

18 Mora Place, NEWARK, NEW YORK

MEMBERS A. M. C. M. A

Miscellaneous Section



INCLUDING
Special Notices, Indexes and General Advertising too
late to classify.

TRADE **SIRENO** MARK

REG. U. S. PAT. OFFICE

Pat. Feb. 4, '08. Pat. July 28, '08

OTHER PATENTS PENDING

ANNOUNCEMENT
for 1909
TWO NEW MODELS

The **SIRENO** adapted for large cars.

The **SIRENO JUNIOR** for Runabouts and Small Touring Cars. Recent improvements make the **SIRENO** more flexible in operation—STARTING INSTANTLY and STOPPING the moment the push button is released. This latter improvement (Pat. applied for) is absolutely AUTOMATIC and "FOOL-PROOF."

The **SIRENO JUNIOR** is a smaller type and is bound to spring into favor—operates in the same manner as the **SIRENO** but has not the braking feature. The volume of sound has a carrying range of one to two miles on country roads.

Both types have BALL-BEARING MOTORS

and

Operate on SIX VOLTS.

New models exhibited at all the shows. Get our new printed matter. Circular "A" describes these models and other accessories for 1909.

Dealers, don't fail to get quotations and cuts for your catalogue. It will pay you. Address us



SIRENO JUNIOR
HALF-SIZE
PRICE, \$25.00



SIRENO
HALF-SIZE
PRICE, \$35.00

THE SIRENO COMPANY

39-41 CORTLANDT STREET, NEW YORK CITY

ALPHABETICAL

INDEX
TO ADVERTISERS

NOTE: The capital letter before each numeral indicates the Section. The numeral indicates the page number in that section.

- Abrams-Mason Co. I-7
Abresch Co., Chas. H-9
Acetylene Gas Illuminating Co. A-10
Acme Motor Car Co. O-31
Adams Co. O-36
Ajax-Grieb Rubber Co. G-9
Allen-Kingston Motor Car Co. O-37
American Ball Bearing Co. I-7
American Belting & Tanning Co. B-18
American Electric Fuse Co. F-17
American Motor Car Co. O-24
American Motor Truck Co. J-6
Anderson Forge & Machine Co. I-8
Andrews Carriage Co. L-4
Apple Electric Co. F-7
Ashtabula Bow Socket Co. H-9
Ashton Valve Co. A-10
Atlas Motor Car Co. Cover
Atwater-Kent Mfg. Works. F-14
Austin Automobile Co. O-32
Automobile Blue Book. A-13-A-14
Automobile Supply Mfg. Co. C-16
Auto Car Equipment Co. J-8
Automobile Trade Directory. G-23
Auto Pump Co. C-21
Auto & Supply Mfg. Co. 66
Avery Portable Lighting Co. E-1
Babcock Electric Carriage Co. L-5
Badger Brass Mfg. Co. E-9
Bailey & Co. L-4
Bailey & Co., C. J. G-14
Baker Motor Vehicle Co. L-3
Baldwin Chain & Mfg. Co. I-6
Barndt-Johnson Auto Supply Co. H-9
Batavia Clamp Co. C-24
Baum Iron Co. C-24
Beaver Mfg. Co. B-11
Bellfuss Motor Co. B-9
Billings & Spencer Co. A-9
Bi-Motor Equipment Co. H-12
Black Mfg. Co. G-20
Blue Ribbon Auto & Carriage Co. H-10
Bosch Magneto Co. F-11
Boston Auto Gage Co. B-11
Bowers Co., F. E. B-16
Bowser & Co., S. F. C-28
Boyle & Co., John. C-14
Brennan Motor Co. B-10
Bretz & Co., J. S. F-4
Briscoe Mfg. Co. B-7
Brown & Co., S. N. H-9
Brownell Motor Co., F. A. B-18
Brush Runabout Co. M-5
Buckeye Jack Mfg. Co. C-21
Buckeye Mfg. Co. O-13
Buffalo Specialty Co. C-17
Buggy Car Co. K-5
Bulck Co., Thos. D. C-14
Buob & Scheu. H-9
Burnett-Compound Spring Co. I-10
Burrows & Co., E. T. G-20
Byrne-Kingston Co. B-20
Cadillac Motor Car Co. O-16
Cameron Car Co. O-36
Canton Drop Forging Co. I-8
Carpenter Co., Walter D. D-7
Cartercar Co. M-4
Chadwick Engineering Works. O-5
Champion Co., A. F-15
Chandlee & Chandlee. A-9
Chase & Co., L. C. H-5
Chase Motor Truck Co. J-9
Chelsea Clock Co. C-1
Chicago Auto Top Co. A-9
Cleanola Co. H-9
Cleveland Auto Cab Co. O-41
Cleveland Canton Spring Co. I-10
Coes Wrench Co. C-12
Colgan Co., J. W. A-2
Collins & Son, G. A. H-11
Columbia Lubricants Co. D-4
Comptoir d'Innovations Pour Automobiles. C-26
Conn. Tel. & Elec. Co. F-14
Continental Caoutchouc Co. G-5-G-6
Continental Motor Mfg. Co. B-13
Corbin Motor Vehicle Corp. O-37
Corcoran Lamp Co. E-7
Cornish Friedburg Motor Car Co. O-36
Correspondence School of Motor Car Practice. A-10
Cowles & Co., C. A-10
Cullman Wheel Co. I-7
Dayton Motor Car Co. O-37
Dayton Rubber Mfg. Co. G-19
DeLuxe Motor Car Co. O-37
Detroit Screw Works. I-7
Detroit Steering Wheel Co. I-8
Diamond Chain & Mfg. Co. B-9
Diamond Rubber Co. G-3-J-4-K-4
Dietz Co., R. E. E-3
Dixon Crucible Co., Joseph. D-26
Dover Stamping & Mfg. Co. C-25
Dow Tire Co. G-19
Driggs-Seabury Ordnance Corp. I-8
Duff Mfg. Co. C-25
Duplex Co. B-14
Duplex Coll Co. F-8
Eberman Auto Appliance Co. C-27
Echo Horn Co. C-24
Eclipse Machine Co. F-7
Edison Auto Accessories Co. F-13
Edmunds & Jones Mfg. Co. E-11
Eldredge Electric Mfg. Co. F-7
Elite Mfg. Co. C-9
Elmore Mfg. Co. O-6
Empire Automobile Tire Co. G-19
Everett-Metzger-Flanders Co. O-39-O-40
Excelsior Supply Co. C-21
Excelsior Tire Co. A-7
Federal Mfg. Co. F-20
Ferro Machine & Foundry Co. B-19
Firestone Tire & Rubber Co. G-22-J-7
Flisk Rubber Co. G-13
Flentje, Ernst. C-13
Fort Pitt Motor Car Co. O-36
Fox, D. G. C-28
Franklin Mfg. Co., H. H. O-30
French Mfg. Co. I-7
G & J Tire Co. G-7
G. L. Economizer Co. B-13
Gabriel Horn Mfg. Co. C-13
Gaeth Automobile Co. O-37
Gearless Motor Car Co. O-17
Geisler Bros. F-7
Gemmer Mfg. Co. I-11
General Accumulator & Battery Co. C-27
General Electric Co. B-22
Gilbert Mfg. Co. C-4
Goodrich Co., B. F. G-11-G-12
Goodyear Tire & Rubber Co. G-18
Gramm-Logan Motor Car Co. J-9
Graves & Congdon Co. H-10
Gray & Davis. E-5-E-6
Grout Auto Co. O-36
Grand Central Palace Show. A-15
Gyroscope Automobile Co. M-9
Ham Mfg. Co., C. T. E-8
Hardy Co., The R. E. F-8
Harris Oil Co. D-7
Hart-Kraft Motor Co. J-1
Hartford Auto Parts Co. B-10
Hartford Suspension Co. E-24
Havoline Oil Co. D-5
Haws, Geo. A. D-7
Hayes Mfg. Co. H-7
Haynes Automobile Co. O-26
Heald Machine Co. B-14
Healy Leather Tire Co. G-20
Hedgeland Mfg. Co. B-17
Heinze Electric Co. F-18
Hercules Electric Co. F-8
Herschell-Spillman Co. B-12
Herz & Co. A-13
Hess-Bright Co. I-8
Hill Dryer Co. C-17
Hoffecker Co. C-22
Hoffman, Geo. W. C-26
Holman Automobile Co. K-1
Holly Bros. Co. B-21
Hotel Gibson House. A-9
Hotel Grand. A-10
Hotel Woodstock. A-10
Howard Motor Works. O-36
Hoyt Electrical Ins. Works. F-11
Hume Carriage Co. H-5
Hupp Motor Car Co. M-6
Hydraulic Pressed Steel Co. I-8
Indestructible Steel Wheel Co. G-20
Interstate Automobile Co. O-9-O-10
Jackson Automobile Co. O-28
Jeffery-DeWitt Co. F-10
Jeffery & Co., Thomas B.M. O-1
Jewell Motor Car Co. O-23
Jenkins & Sons Co., J. D. H-6
K. W. Ignition Co. F-5
Karl & Co., Adolph. G-15
Kellom Co., Chas. F. D-6
Keystone Lubricating Co. D-6
Kimball Tire Case Co. G-20
King Top Mfg. Co. H-5
Kinsey Mfg. Co. B-12
Kissel Motor Car Co. O-21
Kitsee Storage Battery Co. A-9
Knox Automobile Co. J-7
Kokomo Electric Co. F-16
Kokomo Grease Gun Co. D-5
Kongslow, Otto. I-8
Larchmont Mfg. Co. C-15
Lea, E. S. G-20
Leather Tire Goods Co. G-16
Lehman Mfg. Co., J. H. F-4
Leitch Co., Jos. N. H-6
Life Publishing Co. A-10
Lipman Mfg. Co. D-6
Lobe Pump & Machinery Co. B-12
Locke & Co. H-11
Lockwood Bros. B-16
Locomobile Co. of America. O-36
Longarm System Co. B-9
Long Island Auto Supply Mfg. Co. C-18
Long Mfg. Co. B-18
Lowell Wrench Co. C-13
Lucas & Co., John. H-9
Madison Square Garden Show. A-11
Magna Mfg. Co., R. W. F-8
Marion Motor Car Sales Co. O-8
Masury & Son, John W. H-4
Matheson Automobile Co. O-41
Maxwell-Briscoe Motor Co. O-15
McCord & Co. Cover
McCue Co. I-10-M-7
Mechanical & Elec. Mfg. Co. C-22
Merritt & Co. C-27
Metzger, C. A. A-4
Michelin Tire Co. G-21
Midland Motor Car Co. O-37
Miller Bros. H-8
Miller & Starr. D-6
Miller, Chas. E. I-4
Mitchell Motor Car Co. O-26
Model Automobile Co. O-34-O-35
Moline Automobile Co. O-18
Monitor Mfg. Co. F-12
Moon Motor Car Co. O-33
Mora Motor Car Co. Cover
Morgan & Wright. G-8
Mosler & Co., A. R. F-7
Moss Photo Engraving Co. C-29
Motor Car Equipment Co. C-7-C-8
Motz Clincher Tire & Rub. Co. G-20
Murphy Co., G. W. J. H-8
Muttig Co., L. J. H-8
Nadall Mfg. Co. G-1
National Brake & Clutch Co. B-5
National Motor Vehicle Co. O-7
National Welding & Mfg. Co. I-10
National Speed Indicator. A-10
Neustadt Auto & Supply Co. C-22
Nevermiss Spark Plug Co. F-17
New Departure Mfg. Co. I-9
New England Auto Sales Co. C-27
New Idea Sales Co. C-22
New York Gear Works. I-8
N. Y. & N. J. Lubricant Co. D-6
Nurdyke & Marmon Co. O-19
Northway Motor & Mfg. Co. B-9
Nuttall Co., R. D. I-8
Oakland Motor Car Co. O-12
Oakes & Dow Co. F-9
Oeltd & Sons, F. W. B-11
Oids Motor Works. O-37
Oliver Mfg. Co. C-27
Owen & Co., R. M. O-36
Omar Motor Car Co. M-7
Packard Electric Co. F-10
Packard Motor Car Co. O-42
Page-Storms Drop Forge Co. A-9
Palmer & Singer Mfg. Co. O-18
Fantasote Co. H-7
Parish & Bingham. I-7
Parker Mfg. Co. C-27
Parker, Stearns & Co. C-20
Peerless Specialty Co. C-17
Pennsylvania Auto Motor Co. O-29
Pennsylvania Rubber Co. G-15
Perfection Non-Skid Climber Co. C-28
Perfection Wrench Co. C-25
Perkins-Campbell Co. G-20
Petrel Motor Car Co. M-8
Pettingell-Andrews Co. F-13
Peugeot Freres. I-8
Pierome Hide Co. B-11
Pioneer Brass Works. I-8
Pirelli & Co. F-8
Pittsfield Spark Coil Co. F-7
Premier Motor Car Co. O-22
Prest-O-Lite Co. E-10
Price Co., Henry W. C-6
Prosser & Sons, Thos. I-7
Puritan Gas Tank Co. E-10
Quincy Co., J. M. H-9
Quincy - Manchester Sargent Co. C-5
Raimes & Co. C-25
Rajah Auto Supply Co. F-7
Randall-Faichney Co. C-16

Mitchell **Elmore** **Maxwell** **ORBIN** **The Glide** **Haynes** **Autocar**

MONOGRAMS AND NAME PLATES

Cadillac **Rambler** **National** **Acme** **Columbia** **The Aurora** **Pullman**

ALL STYLES WRITE FOR OUR LATEST CATALOG ALL SIZES

J. W. COLGAN CO.

SUBBURY BUILDING — BOSTON, MASS.

Rapid Motor Vehicle Co.....J-5	Spare Motor Wheel of Am.....G-20	Thomas Motor Co., E. R.....O-18	Wainer Pole & Top Co.....H-11
Rauch & Lang Carriage Co.....L-5	Speed Changing Pulley Co.....B-8	Times Square Automobile Co.....C-10	Watt-Detroit Carburetor Co.....B-13
Regal Motor Car Co.....O-27	Speedwell Motor Car Co.....O-36	Timken Roller Bearing Axle Co.....I-5	Weed Chain Tire Grip Co.....C-24
Remy Electric Co.....F-1	Spicer Universal Joint Mfg Co.....I-6	Torbinson Motor Car Co.....B-10	Western Motor Co.....C-26
Republic Rubber Co.....G-10	Splitdorf, C. F.....F-21	Tray Plate Battery Co.....F-8	Weston Elec. Instrument Co.....F-10
Robert Instrument Co.....F-7	Sprague Umbrella Co.....H-1	Trenton Rubber Mfg. Co.....B-11	White & Bagley Co.....D-1
Rome-Turney Radiator Co.....I-11	Standard Co.....F-7	Trimont Mfg. Co.....C-26	Whitlock Coil Pipe Co.....B-10
Royal Tourist Motor Car Co.....O-4	Standard Connecting Rod Co.....B-15	Trojan Hydro Pneumatic Wheel Co.....C-28	Whitney Mfg. Co.....I-7
Royal Equipment Co.....B-9-I-8	Standard Roller Bearing Co.....I-10	Troy Carriage Sunshade Co.....H-10	Widmer Machine Works, C. A.....B-17
Rushmore Dynamo Works.....E-4	Standard Welding Co.....G-14	Tucker, C. F.....A-10	Willard Storage Battery Co.....F-10
	Stanley & Paterson.....F-10	Tudor Mfg. Co.....C-26	Willett Engine & Carburetor Co.....B-15
	Star Speedometer Co.....C-17		Wing Co., Chas.....H-5
Safety Device Co.....C-15	Stearns Co., F. B.....O-18	Uncas Specialty Co.....F-15	Winship, W. W.....A-15
Salisbury Wheel & Mfg. Co.....G-4	Stevens-Britton-Maurel Co.....C-25	Unit Coll Co.....F-19	Winton Motor Carriage Co.....O-43
Samson Leather Tire Co.....G-20	Stevens-Duryea Co.....O-29	U. S. Fastener Co.....H-5	Withee Igniter Co.....F-12
Schacht Mfg. Co.....K-5	Stewart & Clark Mfg. Co.....C-19-C-20	Universal Tire Protector Co.....G-21	Woods Motor Vehicle Co.....L-1
Schaub & Sons Machine Co.....B-12	Stromberg Motor Devices Co. Cover	Veeder Mfg. Co.....C-18	Wray Pump & Register Co.....C-26
Schenectady Spark Plug Co.....A-4	Studebaker Automobile Co.....O-36	Vehicle Specialty Corp.....C-21	Wyman & Gordon Co.....A-9
Schraders Son, A.....C-13	Success Auto Buggy Co.....O-37	Velle Motor Vehicle Co.....O-38	
Schubert Bros. Gear Co.....H-11	Supplementary Spiral Spring Co.....I-1	Victor Clutch Compound Co.....A-10	York Motor Car Co.....O-20
Selden Motor Vehicle Co.....O-11	Swinehart Clincher Tire Co.....G-9	Victor Lamp Co.....E-10	Y. M. C. A. Automobile School.....A-11
Shaler Co., C. A.....C-11	Syracuse Alum. & Bronze Co.....I-9	Victor Tire Traction Co.....C-25	
Shawyer Co.....C-22	Syracuse Chemical Fire Extinguisher Co.....A-15	Warner Instrument Co.....C-25	Zimmerman Mfg. Co.....K-5
Simplex Motor Car Co.....O-25			
Sireno Co.....A-1			
Slama Tire Protector Co.....G-21			
Smith & Co., A. O.....I-9			
Spacke Machine Co., F. W.....B-12			

CLASSIFIED



NOTE.—The capital letter before each numeral indicates the Section. The numeral indicates the page number in that section.

MISCELLANEOUS—SECTION A.

Acetylene Gas Illuminating Co.....A-10	Ashton Valve Co.....A-10	Automobile Blue Book.....A-13-A-14	Billings & Spencer Co.....A-9	Chandlee & Chandlee.....A-9	Chicago Auto Top Co.....A-9	Colgan Co., J. W.....A-2	Correspondence School Motor Car Practice.....A-10	Cowles & Co., C.....A-10	Excelsior Tire Co.....A-7	Grand Central Palace Show.....A-15	Hartford Suspension Co.....C-24	Hertz & Co.....A-12	Hotel Gibson House.....A-9	Hotel Grand.....A-10	Hotel Woodstock.....A-10	Kitsee Storage Battery Co.....A-9	Life Publishing Co.....A-10	Madison Square Automobile Show.....A-11	Mezger, C. A.....A-4	National Speed Indicator.....A-10	Page-Storms Drop Forge Co.....A-9	Schenectady Spark Plug Co.....A-4	Sireno Company.....A-1	Syracuse Chemical Fire Extinguisher Co.....A-15	Tucker, C. F.....A-10	Victor Clutch Compound Co.....A-10	Winship, W. W.....A-15	Wyman & Gordon Co.....A-9	Y.M.C.A. Automobile School.....A-11
--	--------------------------	------------------------------------	-------------------------------	-----------------------------	-----------------------------	--------------------------	---	--------------------------	---------------------------	------------------------------------	---------------------------------	---------------------	----------------------------	----------------------	--------------------------	-----------------------------------	-----------------------------	---	----------------------	-----------------------------------	-----------------------------------	-----------------------------------	------------------------	---	-----------------------	------------------------------------	------------------------	---------------------------	-------------------------------------

POWER PLANT—SECTION B.

American Belting and Tanning Co.....B-18	Beaver Mfg. Co.....B-11	Bellfuss Motor Co.....B-9	Boston Auto Gage Co.....B-11	Bowers Co., F. E.....B-16	Brennan Motor Co.....B-10	Briscoe Mfg. Co.....B-7	Brownell Motor Co., F. A.....B-18	Byrne-Kingston Co.....B-20	Continental Motor Mfg. Co.....B-13	Diamond Chain & Mfg. Co.....B-9	Duplex Company.....B-14	Ferro Machine & Foundry Co.....B-19	G-L Economizer Co.....B-13	General Electric Co.....B-22	Hartford Auto Parts Co.....B-10	Heald Machine Co.....B-14	Hedgeland Mfg. Co.....B-17	Herschell-Spillman Co.....B-12	Holly Bros. Co.....B-21	Kinsey Mfg. Co.....B-12	Lobe Pump & Machinery Co.....B-12	Lockwood Bros.....B-16	Long Arm System Co.....B-9	Long Mfg. Co.....B-18	National Brake & Clutch Co.....B-5	Northway Motor & Mfg. Co.....B-9	Ofeldt & Sons, F. W.....B-11	Pierome Hide Company.....B-11	Royal Equipment Co.....B-9	Schaub & Sons Machine Co.....B-12	Spacke Machine Co., F. W.....B-12	Speed Changing Pulley Co.....B-8	Standard Connecting Rod Co.....B-15
--	-------------------------	---------------------------	------------------------------	---------------------------	---------------------------	-------------------------	-----------------------------------	----------------------------	------------------------------------	---------------------------------	-------------------------	-------------------------------------	----------------------------	------------------------------	---------------------------------	---------------------------	----------------------------	--------------------------------	-------------------------	-------------------------	-----------------------------------	------------------------	----------------------------	-----------------------	------------------------------------	----------------------------------	------------------------------	-------------------------------	----------------------------	-----------------------------------	-----------------------------------	----------------------------------	-------------------------------------

Torbenesen Motor Car Co.....B-10	Trenton Rubber Mfg. Co.....B-11	Watt-Detroit Carburetor Co.....B-18	Western Motor Co.....B-6	Wheeler & Schebler.....B-1	Whitlock Coil Pipe Co.....B-10	Widmer Machine Works, C. A.....B-17	Willett Engine & Carburetor Co.....B-15
----------------------------------	---------------------------------	-------------------------------------	--------------------------	----------------------------	--------------------------------	-------------------------------------	---

ACCESSORIES—SECTION C.

Automobile Supply Mfg. Co.....C-16	Auto Pump Co.....C-21	Batavia Clamp Co.....C-24	Baum Iron Co.....C-24	Bowser & Co., S. F.....C-28	Boyle & Co., John.....C-14	Buckeye Jack Mfg. Co.....C-21	Buffalo Specialty Co.....C-17	Buick Co., Thos. D.....C-14	Chelsea Clock Co.....C-1	Coes Wrench Co.....C-12	Comptrol Innovation pour Automobiles.....C-26	Dover Stamping & Mfg. Co.....C-25	Duff Mfg. Co.....C-25	Eberman Auto Appliance Co.....C-27	Echo Horn Company.....C-24	Elite Mfg. Co.....C-9	Excelsior Supply Co.....C-21	Fientje, Ernst.....C-13	Fox, D. G.....C-28	Gabriel Horn Mfg. Co.....C-13	General Accumulator & Battery Co.....C-27	Gilbert Mfg. Co.....C-4	Hill Dryer Co.....C-17	Hoffecker Co.....C-22	Hoffman, Geo. W.....C-26	Larchmont Mfg. Co.....C-15	Long Island Auto Supply Mfg. Co.....C-18	Lowell Wrench Co.....C-13	Mechanical & Electrical Mfg. Co.....C-22	Merritt & Co.....C-27	Motor Car Equipment Co.....C-7-C-8
------------------------------------	-----------------------	---------------------------	-----------------------	-----------------------------	----------------------------	-------------------------------	-------------------------------	-----------------------------	--------------------------	-------------------------	---	-----------------------------------	-----------------------	------------------------------------	----------------------------	-----------------------	------------------------------	-------------------------	--------------------	-------------------------------	---	-------------------------	------------------------	-----------------------	--------------------------	----------------------------	--	---------------------------	--	-----------------------	------------------------------------

Moss Photo Engraving Co.....C-29	Neustadt Auto Supply Co.....C-22	New England Auto Sales Co.....C-27	New Idea Sales Co.....C-22	Oliver Mfg. Co.....C-27	Parker Mfg. Co.....C-27	Peerless Specialty Co.....C-17	Perfection Non-Skid Climber Co.....C-28	Perfection Wrench Co.....C-25	Price Co., Henry W.....C-6	Quincy - Manchester - Sargent Co.....C-5	Raines & Co.....C-25	Randall-Falchney Co.....C-16	Safety Device Co.....C-15	Schrader's Son, A.....C-13	Shaler Co., C. A.....C-11	Shawyer Company.....C-22	Star Speedometer Co.....C-17	Stevens-Britton-Maurel Co.....C-25	Stewart & Clark Mfg. Co.....C-19-C-20
----------------------------------	----------------------------------	------------------------------------	----------------------------	-------------------------	-------------------------	--------------------------------	---	-------------------------------	----------------------------	--	----------------------	------------------------------	---------------------------	----------------------------	---------------------------	--------------------------	------------------------------	------------------------------------	---------------------------------------

Times Square Automobile Co.....C-10	Trimont Mfg. Co.....C-26	Trojan Hydro Pneumatic Wheel Co.....C-28	Tudor Mfg. Co.....C-26	Veeder Mfg. Co.....C-18	Vehicle Specialty Corp.....C-21	Victor Tire Traction Co.....C-25	Warner Instrument Co.....C-25	Weed Chain Tire Grip Co.....C-24	Wray Pump & Register Co.....C-26
-------------------------------------	--------------------------	--	------------------------	-------------------------	---------------------------------	----------------------------------	-------------------------------	----------------------------------	----------------------------------

LUBRICATING—SECTION D.

Carpenter Co., Walter D.....D-7	Columbia Lubricants Co.....D-4
---------------------------------	--------------------------------

Dixon Crucible Co., Joseph.....D-6	Harris Oil Co., A. W.....D-7	Havoline Oil Co.....D-5	Haws, Geo. A.....D-7	Kellom Co., Chas. F.....D-6	Keystone Lubricating Co.....D-6	Kokomo Grease Gun Co.....D-5	Lipman Mfg. Co.....D-6	Miller & Starr.....D-6	N. Y. & N. J. Lubricant Co.....D-6	White & Bagley Company.....D-1
------------------------------------	------------------------------	-------------------------	----------------------	-----------------------------	---------------------------------	------------------------------	------------------------	------------------------	------------------------------------	--------------------------------

LIGHTING—SECTION E.

Avery Portable Lighting Co.....E-1	Badger Brass Mfg. Co.....E-9	Corcoran Lamp Co.....E-7	Dietz Co., E. E.....E-3	Edmunds & Jones Mfg. Co.....E-11	Gray & Davis.....E-5-E-6	Ham Mfg. Co., C. T.....E-8	Prest-O-Lite Co.....E-10	Puritan Gas Tank Co.....E-10	Rushmore Dynamo Works.....E-4	Victor Lamp Co.....E-10
------------------------------------	------------------------------	--------------------------	-------------------------	----------------------------------	--------------------------	----------------------------	--------------------------	------------------------------	-------------------------------	-------------------------

IGNITION—SECTION F.

American Electric Fuse Co.....F-17	Apple Electric Co.....F-7	Bretz & Co., J. S.....F-4	Bosch Magneto Co.....F-11	Champion Co., A.....F-15	Connecticut Tel. & Elec. Co.....F-14	Duplex Coil Co.....F-8	Eclipse Machine Co.....F-7	Edison Auto Accessories Co.....F-13	Eldredge Electrical Mfg. Co.....F-20	Federal Mfg. Co.....F-20	Geisler Bros.....F-7	Hardy Co., R. E.....F-8	Heinze Electric Co.....F-18	Hercules Electric Co.....F-8	Hoyt Electric Ins. Works.....F-11	Jeffery Dewitt Co.....F-10	Lehman Mfg. Co., J. H.....F-6	Kent Mfg. Works, Atwater.....F-14	Kokomo Electric Co.....F-16	K-W Ignition Co.....F-5	Magna Mfg. Co., R. W.....F-8	Mezger, C. A.....F-20	Monitor Mfg. Co.....F-12	Mosler & Co., A. R.....F-7	Nevermiss Spark Plug Co.....F-17	Oakes & Dow Co.....F-9	Packard Electric Co.....F-10	Pettingell-Andrews Co.....F-13	Pirelli & Co.....F-8	Pittsfield Spark Coil Co.....F-7	Rajah Auto Supply Co.....F-7	Remy Electric Company.....F-1	Robert Instrument Co.....F-7	Splitdorf, C. F.....F-21	Standard Company.....F-7	Stanley & Patterson.....F-10	Tray Plate Battery Co.....F-8	Uncas Specialty Co.....F-15	Unit Coll Co.....F-19	Weston Electric Ins. Co.....F-10	Willard Storage Battery Co.....F-10	Withee Igniter Co.....F-12
------------------------------------	---------------------------	---------------------------	---------------------------	--------------------------	--------------------------------------	------------------------	----------------------------	-------------------------------------	--------------------------------------	--------------------------	----------------------	-------------------------	-----------------------------	------------------------------	-----------------------------------	----------------------------	-------------------------------	-----------------------------------	-----------------------------	-------------------------	------------------------------	-----------------------	--------------------------	----------------------------	----------------------------------	------------------------	------------------------------	--------------------------------	----------------------	----------------------------------	------------------------------	-------------------------------	------------------------------	--------------------------	--------------------------	------------------------------	-------------------------------	-----------------------------	-----------------------	----------------------------------	-------------------------------------	----------------------------

WHEELS, RIMS AND TIRES—SECTION G.

Ajax-Grieb Rubber Co.....G-9	Bailey & Co., C. J.....G-14	Black Mfg. Co.....G-20	Buick Co., Thos. D.....G-17	Burrows & Co., E. T.....G-20	Continental Caoutchouc Co.....G-5-G-6	Dayton Rubber Mfg. Co.....G-19	Diamond Rubber Co.....G-3	Dow Tire Co.....G-19	Empire Automobile Tire Co.....G-19	Firestone Tire & Rubber Co.....G-22	Fisk Rubber Co.....G-13
------------------------------	-----------------------------	------------------------	-----------------------------	------------------------------	---------------------------------------	--------------------------------	---------------------------	----------------------	------------------------------------	-------------------------------------	-------------------------

G. & J. Tire Co.....G-7	Goodrich Co., B. F.....G-11-G-12	Goodyear Tire & Rubber Co.....G-18	Healy Leather Tire Co.....G-20	Indestructible Steel Wheel Co.....G-20	Karl Co., Adolph.....G-15	Kimball Tire Case Co.....G-20	Lea, E. S.....G-20	Leather Tire Goods Co.....G-16	Michelin Tire Co.....G-21	Morgan & Wright.....G-8	Motz Clincher Tire & Rubber Co.....G-20	Nadall Mfg. Company.....G-1	Parker-Stearns & Co.....G-20	Pennsylvania Rubber Co.....G-15	Perkins Campbell Co.....G-20	Republic Rubber Co.....G-10	Salisbury Wheel & Mfg. Co.....G-4	Samson Leather Tire Co.....G-20	Slama Tire Protector Co.....G-21	Spare Motor Wheel Co. of Am.....G-20	Standard Welding Co.....G-14	Swinehart Clincher Tire & Rubber Co.....G-9	Universal Tire Protector Co.....G-21
-------------------------	----------------------------------	------------------------------------	--------------------------------	--	---------------------------	-------------------------------	--------------------	--------------------------------	---------------------------	-------------------------	---	-----------------------------	------------------------------	---------------------------------	------------------------------	-----------------------------	-----------------------------------	---------------------------------	----------------------------------	--------------------------------------	------------------------------	---	--------------------------------------

BODY—SECTION H.

Abresch Co., Chas.....H-9	Ashtabula Bow Socket Co.....H-9	Barndt-Johnson Auto Sup. Co.....H-9	Bl-Motor Equipment Co.....H-12	Blue Ribbon Auto & Carriage Co.....H-10	Brown & Co., S. N.....H-9	Buob & Scheu.....H-9	Chase & Co., L. C.....H-5	Clenola Co.....H-9	Collins & Son, G. A.....H-11	Graves & Congdon Co.....H-10	Hayes Mfg. Co.....H-7	Hume Carriage Co.....H-5	Judkins & Sons Co., J. D.....H-6	King Top Mfg. Co.....H-5	Locke & Co.....H-11	Leitch Co., Jas. N.....H-6	Lucas & Co., John.....H-9	Masury & Sons, J. W.....H-4	Miller Bros.....H-8	Murphy Co., G. W. J.....H-8	Mutty Co., L. J.....H-3	Pantasote Co.....H-7	Quimby & Co., J. M.....H-9	Schubert Bros. Gear Co.....H-11	Sprague Umbrella Company.....H-1	Troy Carriage Sunshade Co.....H-10	U. S. Fastener Co.....H-5	Warner Pole & Top Co.....H-11	Wing Co., Chas.....H-5
---------------------------	---------------------------------	-------------------------------------	--------------------------------	---	---------------------------	----------------------	---------------------------	--------------------	------------------------------	------------------------------	-----------------------	--------------------------	----------------------------------	--------------------------	---------------------	----------------------------	---------------------------	-----------------------------	---------------------	-----------------------------	-------------------------	----------------------	----------------------------	---------------------------------	----------------------------------	------------------------------------	---------------------------	-------------------------------	------------------------

CHASSIS—SECTION I.

Abrams-Mason Co.....I-7	American Ball Bearing Co.....I-7	Anderson Forge & Machine Co.....I-8	Baldwin Chain & Mfg. Co.....I-6	Burnett Compound Spring Co.....I-10	Canton Drop Forging Co.....I-8	Cleveland-Canton Spring Co.....I-10	Cullman Wheel Co.....I-7	Detroit Steering Wheel Co.....I-8	Detroit Screw Works.....I-7	Driggs-Seabury Ordnance Corp.....I-8	French Mfg. Co.....I-7	Gemmer Mfg. Co.....I-11	Hess Bright Mfg. Co.....I-8	Hydraulic Pressed Steel Co.....I-8	Konigsow Mfg. Co., Otto.....I-8	McCue Company.....I-10	Miller, Chas. E.....I-4	National Welding & Mfg. Co.....I-10	New Departure Mfg. Co.....I-9	New York Gear Works.....I-8
-------------------------	----------------------------------	-------------------------------------	---------------------------------	-------------------------------------	--------------------------------	-------------------------------------	--------------------------	-----------------------------------	-----------------------------	--------------------------------------	------------------------	-------------------------	-----------------------------	------------------------------------	---------------------------------	------------------------	-------------------------	-------------------------------------	-------------------------------	-----------------------------

Nuttall Co., R. D.....I-8
 Parish & Bingham.....I-7
 Peugeot Frères.....I-8
 Pioneer Brass Wks.....I-8
 Prosser & Sons, Thos.....I-7
 Rome Turney Radiator Co.....I-11
 Royal Equipment Co.....I-8
 Smith Co., C. O.....I-9
 Spicer Universal Joint Co.....I-6
 Standard Roller Bearing Co.....I-10
 Supplementary Spiral Spring
 Co.....I-1
 Syracuse Aluminum & Bronze
 Co.....I-9
 Timken Roller Bearing Axle
 Co.....I-5
 Whitney Mfg. Co.....I-7

COMMERCIAL CAR—SECTION J.

American Motor Truck Co.....J-6
 Autocar Equipment Co.....J-8
 Chase Motor Truck Co.....J-9
 Diamond Rubber Company.....J-4
 Firestone Tire & Rubber Co.....J-7
 Gramm-Logan Motor Car Co.....J-9
 Hart-Kraft Motor Co.....J-1
 Knox Automobile Co.....J-7
 Rapid Motor Vehicle Co.....J-5

BUGGY TYPE—SECTION K.

Buggy Car Company.....K-5
 Diamond Rubber Company.....K-4
 Holsman Automobile Co.....K-1
 Schacht Mfg. Co.....K-6
 Zimmerman Mfg. Company.....K-5

ELECTRIC VEHICLE—SECTION L.

Andrews Carriage Co.....L-4
 Babcock Electric Carriage Co.....L-5
 Bailey & Co.....L-4
 Baker Motor Vehicle Co.....L-3
 Rauch & Lang Carriage Co.....L-5
 Woods Motor Vehicle Co.....L-1

ROADSTER AND RUNABOUT—SECTION M.

Brush Runabout Company.....M-5
 Cartcar Company.....M-4
 Gyroscope Automobile Co.....M-9
 Hupp Motor Car Co.....M-6
 Jeffery & Co., Thos. B.....M-1
 McCue Company.....M-7
 Omar Motor Car Co.....M-7
 Petrel Motor Car Co.....M-8

TOURING CAR—SECTION O.

Acme Motor Car Co.....O-31

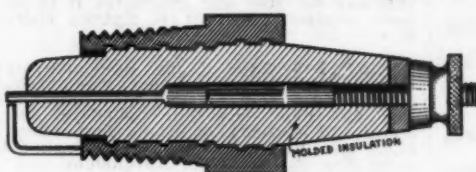
Adams Company.....O-36
 Allen-Kingston Motor Car Co.....O-37
 American Motor Car Co.....O-24
 Austin Automobile Co.....O-32
 Buckeye Mfg. Co.....O-13—O-14
 Cadillac Motor Car Co.....O-16
 Cameron Car Company.....O-36
 Chadwick Engineering Works.....O-5
 Cleveland Auto Cab Co.....O-41
 Corbin Motor Vehicle Corp.....O-37
 Cornish Friedberg Motor Car
 Co.....O-36
 Dayton Motor Car Co.....O-37
 DeLuxe Motor Car Co.....O-37
 Elmore Mfg. Co.....O-6
 Everitt-Metzger Flanders Co.
 O-39—O-40
 Fort-Pitt Motor Mfg. Co.....O-36
 Franklin Mfg. Co., H. H.....O-30
 Gaeth Automobile Co.....O-37
 Gearless Motor Car Co.....O-17
 Grout Automobile Co.....O-36
 Haynes Automobile Co.....O-26
 Howard Motor Works.....O-36
 Interstate Automobile Co.
 O-9—O-10
 Jackson Automobile Co.....O-28
 Jewell Motor Car Co.....O-23
 Kissell Motor Car Co.....O-21
 Locomobile Co.....O-36
 Marion Motor Car Sales Co.....O-8

Mathewson Motor Car Co.....O-41
 Maxwell-Briscoe Motor Co.....O-15
 Mitchell Motor Car Co.....O-36
 Midland Motor Co.....O-37
 Model Automobile Co.....O-34—O-35
 Moline Automobile Co.....O-18
 Moon Motor Car Co.....O-33
 National Motor Vehicle Co.....O-7
 Nordyke & Marmon Co.....O-19
 Oakland Motor Car Co.....O-12
 Olds Motor Works.....O-37
 Owen & Co., R. M.....O-36
 Packard Motor Car Co.....O-42
 Palmer & Singer Mfg. Co.....O-18
 Pennsylvania Auto Motor Co.....O-29
 Premier Motor Mfg. Co.....O-22
 Regal Motor Car Co.....O-27
 Royal Tourist Motor Car Co.....O-4
 Selden Motor Vehicle Co.....O-11
 Simplex Motor Car Co.....O-25
 Speedwell Motor Car Co.....O-36
 Stearns Co., F. B.....O-18
 Stevens-Duryea Co.....O-29
 Studebaker Automobile Co.....O-36
 Success Auto Buggy Co.....O-37
 Thomas Motor Co., E. R.....O-18
 Thos. B. Jeffery & Co.....O-1
 Velle Motor Vehicle Co.....O-28
 Winton Motor Carriage Co.....O-43
 York Motor Car Co.....O-20



The Practical Gas Engineer

What It Is and How To Do It. A book of 150 pages neatly bound in cloth. Sent postpaid for \$1. Address Book Department, The Automobile, 231-241 W. 39th St., New York.



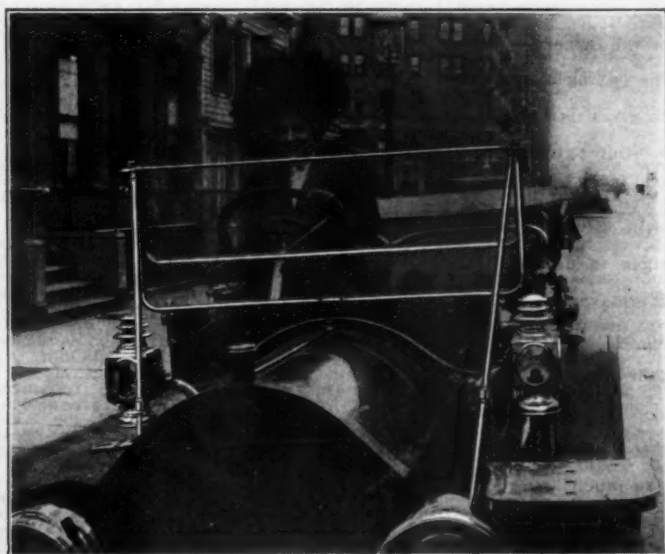
Something New—Distinctly Better than Any you've ever see before.

THE "SCHENECTADY" SPARK PLUG With Indestructible INSULATION

As you know the whole value of a spark plug lies in its insulation. The "Schenectady" is perfectly insulated with a moulded compound that will not break under high voltage, nor has any of the faults of Porcelain or Mica. Is not affected by sudden changes of temperature; will not crack, break, absorb oil or dampness and is so designed that the explosion keeps it clean and free from soot. Price \$1.25. Examine it—you'll be interested. Write for one to-day.

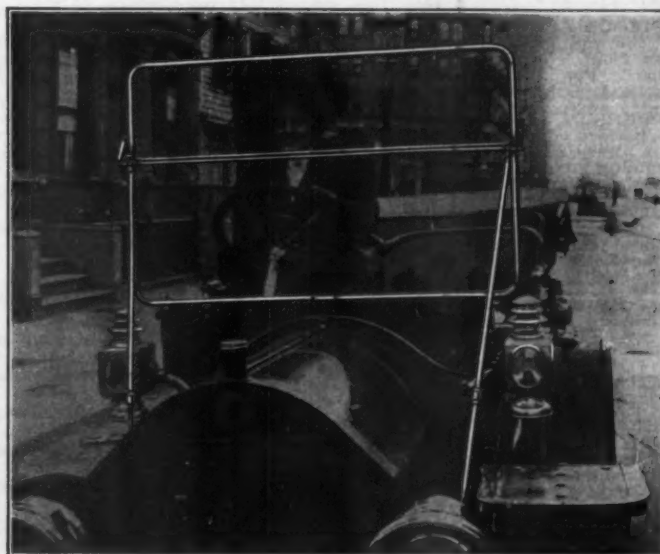
SCHENECTADY SPARK PLUG CO., No. 1259 State Street, Schenectady, New York
 LIBERAL DISCOUNTS TO DEALERS

The Automatic
 FOLDING WIND SHIELD
 ONE HAND CONTROL SELF-LOCKING



WHEN NOT NEEDED—You simply fold it down—Don't think of stopping car or even slackening speed.

The Automatic
 FOLDING WIND SHIELD
 ONE HAND CONTROL SELF-LOCKING



WHEN NEEDED—You just pull it up—No stopping necessary to bother with obstinate nuts, bolts, screws or clamps.

Grand Central
 Palace Show
 Space No. 142

ALL BRASS AND GLASS BEAUTIFUL IN OUTLINE AND ANTI-RATTLING
 MANUFACTURED BY

C. A. MEZGER, Inc.
 1629 BROADWAY, NEW YORK, U. S. A.

FACTORY SALES MANAGERS: NATIONAL SALES CORPORATION, 296 BROADWAY

Madison Square
 Garden Show
 Space No. 323

SPECIAL NOTICES

Advertisements inserted under this heading at 20 cents per line; about 7 words make a line. Remittance should accompany copy. Replies forwarded if postage is prepaid.

Cars for Sale

A 1909 seven-passenger Apperson, cost \$4,700. February delivery. Failure in speculation forces me to sell my contract at a loss of \$1,000; this your gain. F. P., care The Automobile.

A 1907 AUTOCAR RUNABOUT, with top and nearly new.....\$650.00
1907 24-h.p. Jackson runabout, shaft drive, top and glass front, nearly new..... 750.00
1907 35-h.p. Grout, five-passenger, with top, Rutenber motor..... 800.00
Thomas B. Jeffery & Co., 1462 Michigan Ave., Chicago, Ill.

A ALL KINDS of cars at all kinds of prices, \$150 and up. Write us or call and we can satisfy you. Western Auto Sales Co., 309, 10-11 Michigan Ave., Chicago, Ill.

A N ELECTRIC VICTORIA in fine order; batteries nearly new; demonstration; using gas car; reason for selling; cost \$1,375; price, \$500. Address E., room 1004, 261 Broadway, New York.

A N NOUNCEMENT.—SWEEPING REDUCTION in used White Steamers. During the past year we have taken in exchange for newer models, a considerable number of used cars.

We must make room for the new stock, therefore these cars will be sold at ridiculously low prices in order to close them out quickly.

Every car we take in—regardless of how much or how little it has been run—is put through our repair shop and overhauled from engine to rear axle, every working part that shows wear is renewed and the bodies are painted, and so far as practical purposes are concerned, the cars are as good as when they left the factory new.

In buying from us you are dealing with the makers direct, and not with individuals, or second-hand dealers, who have nothing to lose by misrepresentation.

White Steamers from \$300 up.
Write for further details and don't delay if you wish to take advantage of this opportunity. The White Company, Broadway at 62d St., New York City.

A PIERCE-ARROW car, 40-h.p., 1907 model, full equipment, regular Pierce top, and glass front. The car is in first-class condition. For further particulars, address George A. Driggs, Waterbury, Conn.

A PPERSON touring car, cost \$3,750. In perfect condition, with top, glass front, extra tires, etc., \$1,750 in money (not farms or mining stock). E. Hambley, S. E. Eighth and Main Sts., Cincinnati, Ohio.

A UTO BARGAINS.—Before you buy, talk to us. We have them from one to five hundred dollars and can save you money. Ewing-Kean Machine Co., 723 W. Fort, Detroit, Mich. Phone, West 1253-R.

A UTOBOMILE.—Single-cylinder Cadillac, nearly new; reduced price. J. Rockliff, 562 Vine St., Pittsburg, Pa.

A UTOBOMILE BARGAINS.—Used machines, all kinds, \$150 and up. Send for our complete list. Johnson Auto Co., 4390 Olive St., St. Louis, Mo.

B. L. M., 35-h.p. 1908 model, high-speed runabout; very best condition; complete equipment and spare parts. Address "Duncan," care The Automobile.

DON'T PAY TOO MUCH or too little for a slightly used or second-hand automobile. Extravagant claims are made for automobiles at your own price. We have 150 to 200 types and models of various makes of automobiles at a full dollar of automobile value for every dollar of price. Much detailed information of great economic interest to prospective purchasers is here for you; and you will be truly grateful after investigating by a personal call or through the medium of our price list. International Auto Co., 542-544 Wabash Ave., successors to Chicago Auto Warehouse and Chicago Auto Commission Co., Chicago, Ill.

WE HAVE NEW YORK'S REAL AUTOMOBILE SHOW—With the largest garage

in New York and a floor space of over 60,000 feet, crowded with new and second-hand cars, the majority on consignment, we offer more inducements to the man seeking a good automobile at a low price than any automobile show can present. We have over 250 cars for quick sale, at prices from \$150 to \$4,000. The following will give you some idea of what we can offer:

Panhard touring car, fully equipped.....\$1,000
Rochet Schneider, like new, fully equipped 1,450
De Dietrich touring car, fully equipped. 1,000
Packard touring car, like new..... 1,850
Matheson touring car, like new, fully equipped 1,450
Oldsmobile touring car, like new, fully equipped 725
Oldsmobile Tourabout, rumble seat.... 900
Thomas Tourabout 600
American Mors Tourabout, 1908..... 950
Knox air-cooled runabout..... 350
Franklin air-cooled runabout..... 350

We are different from any other house in New York and can offer distinctive values.

Our business necessitates quick sales, and to secure the latter low prices must be offered.

We sell cars on 5 per cent. commission basis, acting as the brokers for the owners. Those who purchase here escape paying a profit to the dealers. This system gives us the choice

of all the desirable cars. Our patrons practically come in contact with the owner and get the car at the figure he is willing to accept.

It would take pages to describe the many cars here, and as there are new arrivals

daily, the best plan is to come and inspect; 'phone or write for bargain list. We are two

blocks from Broadway. This means many hundreds saved in expenses and is one reason

why our prices are so much lower than others ask. Ours is a practical system which

appeals to the intelligent and explains why we are America's real largest dealers. Manhattan Storage Company, 334-340 West 44th

St., New York City, two blocks from 42d St.

Station 9th Ave. "L."

CAMERON, air-cooled, three-passenger roadster, four-cylinder; taken in exchange and thoroughly overhauled; perfect running order; \$550. Cameron Agency, Room 601, 546 Fifth Ave., New York City.

CORBIN touring cars and runabouts, \$800 and up. Thoroughly overhauled by us and guaranteed. Corbin Motor Vehicle Cop'n of N. Y., 1888 Broadway, near 62d St., New York City.

FOR SALE OR EXCHANGE.—2 new Ropid Sight Seeing cars, less than 3 months old; 20-passenger; 30-h.p., 2-cylinder engines; will exchange for touring cars; want 4-cylinder engine and seating 5. Auto Transfer Co., Hattiesburg, Miss.

FIVE (5) ELECTRIC sight seeing automobiles, three 24-passenger terrace seats, two 20-passenger, all half-lazy backs; will sell for less than half price of new. If interested, answer Motor Transit Co., Buffalo, N. Y.

FRANKLIN light touring car; all in fine condition; extra equipment; specifications and photo sent on request; price, \$300. H. J. Daniels, Norwich, N. Y.

HAVING PURCHASED next year's model, will let go my 25-h.p. Peerless, demilimousine body, for \$1,250; completely equipped and put in A-1 shape; no agents need answer. Address Box 134, care The Automobile.

HOLSMAN.—Just overhauled; Schebler carburetor, leather top, special battery case; low price. 47 William St., Newark, N. J.

MAXWELL runabout model LC 1908, with top, gas lamps and generator complete; good as new, only run a short while. Will sell for \$600 and guarantee it to be in perfect order. Write J. O. Sparks, Gaffney, S. C.

MUST DISPOSE of my Stoddard-Dayton roadster for cash at once; was purchased in May, 1908, and run only 2,000 miles; looks just like new; has four cylinders, 40-h.p. motor; in perfect condition; first offer for \$1,400 gets it; dealers need not answer. Address Box 23, care The Automobile.

ODEL S. "07" HAYNES, 4-cylinder, 5-passenger touring car, in first-class condition; car and equipment cost \$2,800; will sell for less than half cost. Write for particulars to G. A. St. Germain, 241 Main St., Berlin, N. H.

MY KNOX auto for \$250, in fine condition, two seats, rear seat detachable; will make good delivery car; three extra tires; this machine always goes. R. B. Barnes, 72 Tremont St., Rochester, N. Y.

ONE 1907 Model G touring car, fully equipped, in A-1 condition; run about 5,000 miles; will sell at a bargain. Dauer Auto Co., Providence, R. I.

ONE 1907 Pope Hartford roadster. One 1906, Type 12, Pope Toledo Touring car. One 1907, Model R, 4-cylinder Stevens-Duryea. One 1907, Model U, 6-cylinder Stevens-Duryea. One 1908, Model S, Ford roadster. One Model E, single-cylinder Rambler. All these cars in good condition and will be sold cheap. For further particulars write The Arthur Gardiner Garage, Kenosha, Wis.

ONE 1906 White steam touring car, equipped with top, etc.; price, \$1,000. One 1906 Model "G" Franklin touring car, equipped with top; A-1 condition; price, \$850. One 1908 Model "10" runabout; used a few times for demonstrating; A-1 shape; price, \$350. One 1904 Cadillac touring car; good condition; price, \$350. One 1907 Oldsmobile runabout, A-1 condition; price, \$1,800. One 1906 Model R Stevens-Duryea, overhauled and repainted; price, \$1,200. One 1907 White steam runabout, good condition; price, \$1,300. One 1906 Thomas with tourabout body; first-class condition; price, \$1,500. Halsey Automobile Co., St. Louis, Mo.

PEERLESS "30" 1909.—Regular touring body with removable glass enclosure for winter. Specially fine job; cost \$5,400. Family going abroad, will sell at a reduction. Address G. R., care The Automobile.

RAMBLER, two-cylinder 1906 model; equipment, full set of lamps, generator and top; in fine condition throughout; tires, Goodrich; will accept first reasonable offer. Address Box 656, Waterbury, Conn.

SACRIFICE.—1907 Thomas Flyers; 1906 Acme; new 1907 Reo touring car; second-hand Model "R" Ford, 1907. E. S. Youse, Reading, Pa.

STEVENS-DURYEA little six, run 2,000 miles; bargain; cash. Stevens, 265 Halsey St., Newark, N. J.

STODDARD-DAYTON—Some slightly used cars for sale; runabout, roadster, touring car and limousine; in A-1 condition. The Dayton Motor Car Co., Dayton, Ohio.

TWO-PASSENGER RUNABOUT, 6-h.p., sliding gear, shaft drive; fine condition; \$150. The Auto Exchange, 7 Reservoir, Providence, R. I.

WANTED TO SELL or exchange, demi-limousine 30-35 Rainier, for a small runabout 1908 Buick. Gem, 86 Warren St., New York City.

WE HAVE for sale the following second-hand cars at bargain prices; 1907 Model D touring car; 1906 Model D touring car; 1907 Model G runabout. Franklin Automobile Company, 73d St., Amsterdam Ave. and Broadway, New York.

WHITE steam touring car, 1908 Model K, used only five months and in superb condition throughout; nicely equipped and will be sold at a bargain if taken at once. Address White Steamer, 1200 Niagara St., Buffalo, N. Y.

WINTON '06 four-cylinder touring car, in perfect condition, fully equipped, top, \$800. The Fulton Garage, Fulton, N. Y.

WINTON SIXTEEN-SIX, 1908 model, nicely equipped and in absolutely fine condition; will accept \$2,400 if taken at once. E. R. Thomas Motor Co., Second-Hand Department, 1200 Niagara St., Buffalo, N. Y.

WOULD SELL Pope-Tribune, one-cylinder, A-1 condition and extras; new raccoon coat and gloves, fur cap; new Witherbee 6-60, tire covers, oil lamps, ammeter-voltmeter, all for \$200. Address Box 282, Pearl River, N. Y.

\$1000 Haynes 50-h.p. touring car, new. Braby & Myers, 364 Columbus Ave., Boston, Mass.

1906 CADILLAC touring car, 1908 Great Western No. 12 touring car, 24-h.p.; 1907 Reo touring car, 20-h.p.; 1906 Oldsmobile, all in good condition. The Fulton Garage, Fulton, N. Y.

1908 REO ROADSTER, five lamps, top, Warner speedometer, extra rear seats. F. E. Mason, 93 Exchange St., Rochester, N. Y.

1908 FRANKLIN Model G Runabout; top and all extras. This car is practically new, been run little over 1,000 miles; price, \$1,200. C. S. Ransom, Albany, N. Y.

1908 FRANKLIN Model D touring car, 28-h.p., has been used as demonstrator, with double system ignition, Bosch magneto, in first-class condition, with top, glass front and all extras, at a very reasonable figure. Dauer Auto Co., Providence, R. I.

1908 MAXWELL, Cameron, runabout and touring cars; 1907 Ford, Pullman, Stoddard-Dayton, Buick and Reo runabout and touring cars; 1906 Acme touring car; 1905 Rambler and Locomobile touring cars; get prices and specification forms. Berks Auto & Garage Co., Reading, Pa.

1908 40-H.P. BUICK touring car, in absolutely first-class condition in every respect; painted maroon and red upholstery; complete with top, speedometer, clock, chains, full lamp equipment, two extra shoes, inner tube and equipped with magneto; cost owner \$2,800 and run less than 2,500 miles. Address "Buick Bargain," care this paper.

Cars Wanted

HAVE ABOUT \$500; want an automobile; must be four-cylinder, shaft driven, sliding gear; no objection to one out of repair or broken if of good make. Correspondence solicited. 725 E. Water St., Syracuse, N. Y.

TWO four or six-cylinder motors, 20 to 40-h.p.; must be in good shape. W. W. Butts, Oxford, New York.

WANT the best five-passenger car \$400 will buy. G. M. C., room 422, 47 West Forty-second street, New York.

WANTED—Carrico two-cylinder air-cooled engine; must be cheap. L. T. Rhoades, Phoenixville, Pa.

WANTED—Oakland, two-cylinder; state price and equipment. Address "H. L. P.," care The Automobile.

WANTED—1908 Stevens-Duryea light six; state price, shop number, equipment. Address "F. F.," care The Automobile.

WANTED TO TRADE for modern 4-cylinder automobile 400 shares of Kalamazoo Gold Mining stock, par value \$1.00 per share. F. W. Fisher, Sedalia, Mo.

WANTED—Small, second-hand touring car; late model, tonneau body preferred; give full particulars and price. Address Box 144, care The Automobile.

WE WILL PAY full value in spot cash for your automobiles in quantities from one to one hundred. Call or mail descriptions. Broadway Mammoth Automobile Exchange, 245 West 56th St., New York City.

Parts and Accessories (FOR SALE.)

A LIMOUSINE BODY for sale; in first-class condition; fits any car; cost \$2,200; bargain. 1225 McGee St., Kansas City, Mo.

AUTO TIRES—All the best makes of tires on hand, at cut prices; a big stock of "specials" and "seconds" at "Bargain Counter Prices"; we will save you money on any make and any size; write or call. Broadway Mammoth Automobile Exchange, 245 West 56th St., New York City.

AUTO TIRES—28x3, \$10; 30x3, \$11; 30x3½, \$13. These are brand new, clean goods. Overstocked. Must sell. Write to-day for new 1909 prices on any size. Will surprise you. A. H. Kasner, 152 Church St., New York City.

AUTO TIRES, new clincher casings, fresh stock, every one a bargain:

28x3	.....\$10.65	30x4	.....\$17.90
30x3	.....11.15	32x4	.....18.90
32x3	.....11.75	34x4	.....21.00
28x3½	.....13.00	36x4	.....22.00
30x3½	.....13.50	34x4½	.....21.50
32x3½	.....15.80	36x4½	.....23.50
34x3½	.....16.50	36x5	.....26.00
36x3½	.....16.50		

W. M. Sharpe, 118 West Broadway, New York City.

BRAKES—External double-acting band brakes; 9½-9¼"x1¼"; 7½-9"x2¼"; 5½-6"x2". No better made; will sacrifice to quick buyer. Address Blackwell Brake Co., Box 1031, Bridgeport, Conn.

BARGAINS in leather non-skid tire protectors; all sizes and prices. Fan belts for all cars, guaranteed 10,000 miles. Write us or call. Detroit Leather Works, 97 Larned St., East Detroit, Mich.

BARGAINS—4-cylinder dash coils, \$22; five-bevel mechanical oiler, \$8; bevel gear axles, \$80 per pair; wool wheels, all sizes, \$18 per set; clincher tires, 28x3, \$9; 30x3, \$11; tonneau body painted and upholstered, \$40; 2-cylinder dash coils, \$9; honeycomb radiator, \$20; three speed and reverse transmission, \$35; opposed motor, air-cooled, 3x3, \$35; 4x4, \$50; 4½x4, \$75; 4½x5, \$90; 4½x4, water-cooled, \$75; 4½x5 \$90; 5¼x4½, \$120; 5x4½, \$90; front axles, \$5 to \$18; bevel gear axles, \$85 per set; gas tanks, \$2.50; steel dashes, \$4; three speed and reverse transmission with differential, \$60; Warner No. 3 differential with sprocket, \$9; complete set of parts to build 2,000-lb. tonneau car, \$600. Auto Parts Co., 52 W. Jackson Blvd., Chicago.

BOOTH'S FELT PACKINGS for repairing automobiles are designed to retain the oil, exclude the dust and tighten loose joints, and are absolutely necessary in connection with ball, roller and plain bearings, hubs and transmission cases, and are made in strips and endless rings of any size and thickness to fit any car; dust rings for the hubs, strips for transmission cases, washers for all lubricating and dust-excluding purposes. I have dies to fit any bearing of any make of car, and can fill any order within twenty-four hours. You will get exactly what you want, and the price will be right. There are so many sizes, no dealer carries a full stock. Write for prices and give dimensions. N. E. Booth, 741 39th St., Brooklyn, N. Y.

ENGINES, axles, transmissions, frames, bodies, carburetors, timers and auto parts generally at bargain prices. Let us know what you want. Logan Construction Co., Chillicothe, Ohio.

BARGAINS in new inner tubes; all guaranteed to hold air. Purchased at special sale.

28x2½	.....\$2.50
28x3	.....3.00
28x3½	.....3.50
30x3	.....4.00
30x3½	.....4.50

Write for prices on other supplies. We also repair an ymake of tire. All work guaranteed. Chicago Vulcanizing Co., 1400 Michigan Ave., Chicago, Ill.

FOR SALE OR TRADE—Four sets of Kimball steel tire casings, new; one Prest-O-Lite tank; steel coil and one 1906 single-cylinder Olds runabout. P. P. Pagett, General Delivery, Indianapolis, Ind.

FOR SALE—300 sets 28x3 best grade artillery wheels fitted with clincher rings, less hubs; write for bargain prices on single sets or the lot. Thomas B. Jeffery & Co., Kenosha, Wis.

FOR SALE OR EXCHANGE, being overstocked: several standard high tension magnetos, also double ignition systems, coil and distributors. Wanted cash offer, or will accept in exchange, any standard tires (sizes wanted, 34x4 and 36x4½), or New Victor Talking Machines. Offer also wanted on a 1909 Continental car, value \$3,500. Full particulars, address "Retired Auto Manufacturer," care The Automobile.

OUR FRICTION TRANSMISSION to transmit 8-h.p. at \$21 is like finding money; other bargains. Send for catalogue. Climax Electric Works, New Salem, Mass.

FORD RUNABOUT owners, now is the time to order our outfit to change your N. S. or R. into new "S" roadster, new fenders, and rumble seats, dash hoods, folding hoods, glass fronts, tops, ollers, magnetos. Write for catalogue to-day. Auto Rebuilding Co., 1349 Michigan Ave., Chicago, Ill.

RADIATORS, hoods, mud guards, metal dishes, gasoline and water tanks. If building or remodeling a car, it will pay you to write us, as we lead in this line. Auto Sheet Metal Works, 2230 Michigan Ave., Chicago, Ill.

SIX CYLINDERS, \$1.50; four cylinders, \$1; two cylinders, 50 cents, is all you have to pay for the most indispensable auto tool made, "The Trouble Finder." When put on the spark plug, you can tell if your timer is in the right place; you can tell which cylinder is not doing its work, caused by leaky valves or a faulty spark plug. Works the same on dry cells, storage or magneto. A good investment for the owner, chauffeur and the repairman. Sent prepaid for stamps, check or currency. Sallander Auto Co., Fort Madison, Iowa.

SPECIAL LOT supplementary springs, wind shields, storage batteries, tire treads, repair kits, boots and patches. Factory prices. Auto Economy Co., 1426 Michigan Ave., Chicago.

SPECIAL lot 1909 Schebler Carburetor outfits, complete for Reo, Ford, Buick, Maxwell, Cadillac, and other cars; more power, easier starting, better control; \$10.75 to \$18 complete. Jenkins Specialty Mfg. Co., Sumter, S. C.

STEVENS-DURYEA repair parts.—15 per cent. discount. C. D. Snow, 62 Glenham St., Providence, R. I.

TIRE BARGAINS—25 sets 36x3½, 5 sets 32x4½ Dunlop Universal tires; also several sets Clincher tires, millimeter sizes, plain and Midgley tread; all first-class goods; excellent value. C. A. Leonard, 691 Park St., Hartford, Conn.

TIRES, TIRES—We can sell any make, any size or style tires or tubes for less money than any dealer in the United States. Do not buy until you get our prices. Send for complete list. Excelsior Tire Company, 1777 Broadway, New York City.

TIRES—New goods, new goods, 1908 stock.

28x2½	.....\$9.00	28x3	.....10.00
30x3	.....11.00	34x4	.....20.00
30x3½	.....13.00	30x4	.....17.50
32x3½	.....16.00	32x4	.....19.00

Mail orders filled promptly. We ship goods to every part of the globe. Anchor Tire Co., 88 Chambers St., New York City.

UNTIL FURTHER NOTICE, runabout tops, \$20; touring car tops, \$35. C. G. Meyer & Son, Tiffin, Ohio.

WE OFFER GENUINE BARGAINS in five-passenger touring bodies, finely upholstered and finished in Brewster green; illustrations and dimensions sent on request. Berkshire Automobile Co., Pittsfield, Mass.

(Special Notices continued on page A-7.)

SPECIAL NOTICES

Advertisements inserted under this heading at 50 cents per line; about 7 words make a line. Remittance should accompany copy. Replies forwarded if postage is prepaid.

Cars for Sale

A 1909 seven-passenger Apperson, cost \$4,700. February delivery. Failure in speculation forces me to sell my contract at a loss of \$1,000; this your gain. F. F. care The Automobile.

A 1907 AUTOCAR RUNABOUT, with top and nearly new.....\$650.00
1907 24-h.p. Jackson runabout, shaft drive, top and glass front, nearly new..... 750.00
1907 35-h.p. Grout, five-passenger, with top, Rutenber motor..... 800.00
Thomas B. Jeffery & Co., 1462 Michigan Ave., Chicago, Ill.

A LL KINDS of cars at all kinds of prices, \$150 and up. Write us or call and we can satisfy you. Western Auto Sales Co., 309, 10-11 Michigan Ave., Chicago, Ill.

A N ELECTRIC VICTORIA in fine order; batteries nearly new; demonstration; using gas car; reason for selling; cost \$1,375; price, \$500. Address E., room 1004, 261 Broadway, New York.

A NNOUNCEMENT.—SWEEPING REDUCTION in used White Steamers. During the past year we have taken in exchange for newer models, a considerable number of used cars.

We must make room for the new stock, therefore these cars will be sold at ridiculously low prices in order to close them out quickly.

Every car we take in—regardless of how much or how little it has been run—is put through our repair shop and overhauled from engine to rear axle, every working part that shows wear is renewed and the bodies are painted, and so far as practical purposes are concerned, the cars are as good as when they left the factory new.

In buying from us you are dealing with the makers direct, and not with individuals, or second-hand dealers, who have nothing to lose by misrepresentation.

White Steamers from \$300 up.
Write for further details and don't delay if you wish to take advantage of this opportunity. The White Company, Broadway at 62d St., New York City.

A PIERCE-ARROW car, 40-h.p., 1907 model, full equipment, regular Pierce top, and glass front. The car is in first-class condition. For further particulars, address George A. Driggs, Waterbury, Conn.

A PPERSON touring car, cost \$3,750. In perfect condition, with top, glass front, extra tires, etc., \$1,750 in money (not farms or mining stock). E. Hambley, S. E. Eighth and Main Sts., Cincinnati, Ohio.

A UTO BARGAINS.—Before you buy, talk to us. We have them from one to five hundred dollars and can save you money. Ewing-Kean Machine Co., 723 W. Fort, Detroit, Mich. Phone, West, 1253-R.

A UTOBILITE.—Single-cylinder Cadillac, nearly new; reduced price. J. Rockliff, 552 Vine St., Pittsburg, Pa.

A UTOBILITE BARGAINS.—Used machines, all kinds, \$150 and up. Send for our complete list. Johnson Auto Co., 4390 Olive St., St. Louis, Mo.

B. L. M., 35-hp., 1908 model, high-speed runabout; very best condition; complete equipment and spare parts. Address "Duncan," care The Automobile.

DON'T PAY TOO MUCH or too little for a slightly used or second-hand automobile. Extravagant claims are made for automobiles at your own price. We have 150 to 200 types and models of various makes of automobiles at a full dollar of automobile value for every dollar of price. Much detailed information of great economic interest to prospective purchasers is here for you; and you will be truly grateful after investigating by a personal call or through the medium of our price list. International Auto Co., 542-544 Wabash Ave., successors to Chicago Auto Warehouse and Chicago Auto Commission Co., Chicago, Ill.

WE HAVE NEW YORK'S REAL AUTOMOBILE SHOW—With the largest garage

in New York and a floor space of over 60,000 feet, crowded with new and second-hand cars, the majority on consignment, we offer more inducements to the man seeking a good automobile at a low price than any automobile show can present. We have over 250 cars for quick sale, at prices from \$150 to \$4,000. The following will give you some idea of what we can offer:

Panhard touring car, fully equipped....	\$1,000
Rochet Schneider, like new, fully equipped	1,450
De Dietrich touring car, fully equipped.	1,000
Packard touring car, like new.....	1,850
Matheson touring car, like new, fully equipped	1,450
Oldsmobile touring car, like new, fully equipped	725
Oldsmobile Tourabout, rumble seat....	900
Thomas Tourabout	600
American Mors Tourabout, 1908.....	950
Knox air-cooled runabout.....	350
Franklin air-cooled runabout.....	350

We are different from any other house in New York and can offer distinctive values.

Our business necessitates quick sales, and to secure the latter low prices must be offered.

We sell cars on 5 per cent. commission basis, acting as the brokers for the owners. Those

who purchase here escape paying a profit to the dealers. This system gives us the choice of all the desirable cars. Our patrons practically come in contact with the owner and

get the car at the figure he is willing to accept. It would take pages to describe the

many cars here, and as there are new arrivals

daily, the best plan is to come and inspect;

'phone or write for bargain list. We are two blocks from Broadway. This means many

hundreds saved in expenses and is one reason why our prices are so much lower than

others ask. Ours is a practical system which appeals to the intelligent and explains why

we are America's real largest dealers. Man-

hattan Storage Company, 334-340 West 44th

St., New York City, two blocks from 42d St.

Station 9th Ave. "L."

CAMERON, air-cooled, three-passenger roadster, four-cylinder; taken in exchange and thoroughly overhauled; perfect running order; \$550. Cameron Agency, Room 601, 546 Fifth Ave., New York City.

CORBIN touring cars and runabouts, \$800 and up. Thoroughly overhauled by us and guaranteed. Corbin Motor Vehicle Cop'n of N. Y., 1888 Broadway, near 62d St., New York City.

FOR SALE OR EXCHANGE.—2 new Rapid Sight Seeing cars, less than 3 months old; 20-passenger; 30-h.p., 2-cylinder engines; will exchange for touring cars; want 4-cylinder engine and seating 5. Auto Transfer Co., Hattiesburg, Miss.

FIVE (5) ELECTRIC sight seeing automobiles, three 24-passenger terrace seats, two 20-passenger, all half-lazy backs; will sell for less than half price of new. If interested, answer Motor Transit Co., Buffalo, N. Y.

FRANKLIN light touring car; all in fine condition; extra equipment; specifications and photo sent on request; price, \$300. H. J. Daniels, Norwich, N. Y.

HAVING PURCHASED next year's model, I will let go my 25-h.p. Peerless, demilimousine body, for \$1,250; completely equipped and put in A-1 shape; no agents need answer. Address Box 134, care The Automobile.

HOLSMAN.—Just overhauled; Schebler carburetor, leather top, special battery case; low price. 47 William St., Newark, N. J.

MAXWELL runabout model LC 1908, with top, gas lamps and generator complete; good as new, only run a short while. Will sell for \$600 and guarantee it to be in perfect order. Write J. O. Sparks, Gaffney, S. C.

MUST DISPOSE of my Stoddard-Dayton roadster for cash at once; was purchased in May, 1908, and run only 2,000 miles; looks just like new; has four cylinders, 40-h.p. motor; in perfect condition; first offer for \$1,400 gets it; dealers need not answer. Address Box 23, care The Automobile.

ODEL S., "07" HAYNES, 4-cylinder, 5-passenger touring car, in first-class condition; car and equipment cost \$2,800; will sell for less than half cost. Write for particulars to G. A. St. Germain, 241 Main St., Berlin, N. H.

MY KNOX auto for \$250, in fine condition, two seats, rear seat detachable; will make good delivery car; three extra tires; this machine always goes. R. B. Barnes, 72 Tremont St., Rochester, N. Y.

ONE 1907 Model G touring car, fully equipped, in A-1 condition; run about 5,000 miles; will sell at a bargain. Dauer Auto Co., Providence, R. I.

ONE 1907 Pope Hartford roadster. One 1906, Type 12, Pope Toledo Touring car. One 1907, Model R, 4-cylinder Stevens-Duryea. One 1907, Model U, 6-cylinder Stevens-Duryea. One 1908, Model S, Ford roadster. One Model E, single-cylinder Rambler. All these cars in good condition and will be sold cheap. For further particulars write The Arthur Gardiner Garage, Kenosha, Wis.

ONE 1906 White steam touring car, equipped with top, etc.; price, \$1,000. One 1906 Model "G" Franklin touring car, equipped with top; A-1 condition; price, \$850. One 1908 Model "10" runabout; used a few times for demonstrating; A-1 shape; price, \$850. One 1904 Cadillac touring car; good condition; price, \$350. One 1907 Oldsmobile runabout, A-1 condition; price, \$1,800. One 1906 Model R Stevens-Duryea, overhauled and repainted; price, \$1,200. One 1907 White steam runabout, good condition; price, \$1,300. One 1906 Thomas with tourabout body; first-class condition; price, \$1,500. Halsey Automobile Co., St. Louis, Mo.

PEEERLESS "30" 1909.—Regular touring body with removable glass enclosure for winter. Specially fine job; cost \$5,400. Family going abroad, will sell at a reduction. Address G. R., care The Automobile.

RAMBLER, two-cylinder 1906 model; equipment, full set of lamps, generator and top; in fine condition throughout; tires, Goodrich; will accept first reasonable offer. Address Box 656, Waterbury, Conn.

SACRIFICE.—1907 Thomas Flyers; 1906 Acme; new 1907 Reo touring car; second-hand Model "R" Ford, 1907. E. S. Youse, Reading, Pa.

STEVENS-DURVEA little six, run 2,000 miles; bargain; cash. Stevens, 265 Halsey St., Newark, N. J.

STODDARD-DAYTON—Some slightly used cars for sale; runabout, roadster, touring car and limousine; in A-1 condition. The Dayton Motor Car Co., Dayton, Ohio.

TWO-PASSENGER RUNABOUT, 6-h.p., sliding gear, shaft drive; fine condition; \$150. The Auto Exchange, 7 Reservoir, Providence, R. I.

WANTED TO SELL or exchange, demi-limousine 30-35 Rainier, for a small runabout 1908 Buick. Gem, 86 Warren St., New York City.

WE HAVE for sale the following second-hand cars at bargain prices; 1907 Model D touring car; 1906 Model D touring car; 1907 Model G runabout. Franklin Automobile Company, 73d St., Amsterdam Ave. and Broadway, New York.

WHITE steam touring car, 1908 Model K, used only five months and in superb condition throughout; nicely equipped and will be sold at a bargain if taken at once. Address White Steamer, 1200 Niagara St., Buffalo, N. Y.

WINTON '06 four-cylinder touring car, in perfect condition, fully equipped, top, \$800. The Fulton Garage, Fulton, N. Y.

WINTON SIXTEEN-SIX, 1908 model, nicely equipped and in absolutely fine condition; will accept \$2,400 if taken at once. E. R. Thomas Motor Co., Second-Hand Department, 1200 Niagara St., Buffalo, N. Y.

WOULD SELL Pope-Tribune, one-cylinder, A-1 condition and extras; new raccoon coat and gloves, fur cap; new Witherbee 6-60, tire covers, oil lamps, ammeter-voltmeter, all for \$200. Address Box 282, Pearl River, N. Y.

\$1000 Haynes 50-h.p. touring car, new. Braby & Myers, 364 Columbus Ave., Boston, Mass.

1906 CADILLAC touring car, 1908 Great Western No. 12 touring car, 24-h.p.; 1907 Reo touring car, 20-h.p.; 1906 Oldsmobile, all in good condition. The Fulton Garage, Fulton, N. Y.

1908 REO ROADSTER, five lamps, top, Warner speedometer, extra rear seats. F. E. Mason, 93 Exchange St., Rochester, N. Y.

1908 FRANKLIN Model G Runabout; top and all extras. This car is practically new, been run little over 1,000 miles; price, \$1,200. C. S. Ransom, Albany, N. Y.

1908 FRANKLIN Model D touring car, 28-h.p., has been used as demonstrator, with double system ignition, Bosch magneto, in first-class condition, with top, glass front and all extras, at a very reasonable figure. Dauer Auto Co., Providence, R. I.

1908 MAXWELL, Cameron, runabout and touring cars; 1907 Ford, Pullman, Stoddard-Dayton, Buick and Reo runabout and touring cars; 1906 Acme touring car; 1905 Rambler and Locomobile touring cars; get prices and specification forms. Berks Auto & Garage Co., Reading, Pa.

1908 40-H.P. BUICK touring car, in absolutely first-class condition in every respect; painted maroon and red upholstering; complete with top, speedometer, clock, chains, full lamp equipment, two extra shoes, inner tube and equipped with magneto; cost owner \$2,800 and run less than 2,500 miles. Address "Buick Bargain," care this paper.

Cars Wanted

HAVE ABOUT \$500; want an automobile; must be four-cylinder, shaft driven, sliding gear; no objection to one out of repair or broken if of good make. Correspondence solicited. 725 E. Water St., Syracuse, N. Y.

TWO four or six-cylinder motors, 20 to 40-h.p.; must be in good shape. W. W. Butts, Oxford, New York.

WANT the best five-passenger car \$400 will buy. G. M. C., room 422, 47 West Forty-second street, New York.

WANTED.—Carrio two-cylinder air-cooled engine; must be cheap. L. T. Rhoades, Phoenixville, Pa.

WANTED.—Oakland, two-cylinder; state price and equipment. Address "H. L. P.," care The Automobile.

WANTED.—1908 Stevens-Duryea light six; state price, shop number, equipment. Address "F. F.," care The Automobile.

WANTED TO TRADE for modern 4-cylinder automobile 400 shares of Kalamazoo Gold Mining stock, par value \$1.00 per share. F. W. Fisher, Sedalla, Mo.

WANTED.—Small, second-hand touring car; late model, tonneau body preferred; give full particulars and price. Address Box 144, care The Automobile.

WE WILL PAY full value in spot cash for your automobiles in quantities from one to one hundred. Call or mail descriptions. Broadway Mammoth Automobile Exchange, 245 West 56th St., New York City.

Parts and Accessories (FOR SALE.)

A LIMOUSINE BODY for sale; in first-class condition; fits any car; cost \$2,200; bargain. 1225 McGee St., Kansas City, Mo.

AUTO TIRES.—All the best makes of tires on hand, at cut prices; a big stock of "specials" and "seconds" at "Bargain Counter Prices"; we will save you money on any make and any size; write or call. Broadway Mammoth Automobile Exchange, 245 West 56th St., New York City.

AUTO TIRES.—28x3, \$10; 30x3, \$11; 30x3½, \$13. These are brand new, clean goods. Overstocked. Must sell. Write to-day for new 1909 prices on any size. Will surprise you. A. H. Kasner, 152 Church St., New York City.

AUTO TIRES, new clincher casings, fresh stock, every one a bargain:

28x3	.....\$10.65	30x4	.....\$17.90
30x3	.....11.15	32x4	.....18.90
32x3	.....11.75	34x4	.....21.00
28x3½	.....13.00	36x4	.....22.00
30x3½	.....13.50	34x4½	.....21.50
32x3½	.....15.80	36x4½	.....23.50
34x3½	.....16.50	36x5	.....26.00
36x3½	.....16.50		

W. M. Sharpe, 118 West Broadway, New York City.

BRAKES.—External double-acting band brakes; 939-9½"x1¼"; 72-9"x2¼"; 67-6"x2". No better made; will sacrifice to quick buyer. Address Blackwell Brake Co., Box 1031, Bridgeport, Conn.

BARGAINS in leather non-skid tire protectors; all sizes and prices. Fan belts for all cars, guaranteed 10,000 miles. Write us or call. Detroit Leather Works, 97 Larned St., East Detroit, Mich.

BARGAINS.—4-cylinder dash coils, \$22; five-feed mechanical oiler, \$8; bevel gear axles, \$80 per pair; wool wheels, all sizes, \$18 per set; clincher tires, 28x3, \$9; 30x3, \$11; tonneau body painted and upholstered, \$40; 2-cylinder dash coils, \$9; honeycomb radiator, \$20; three speed and reverse transmission, \$35; opposed motor, air-cooled, 3x3, \$35; 4x4, \$50; 4½x4, \$75; 4½x5, \$90; 4½x4, water-cooled, \$75; 4½x5 \$90; 5½x4½, \$120; 5x4½, \$90; front axles, \$5 to \$18; bevel gear axles, \$85 per set; gas tanks, \$2.50; steel dashes, \$4; three speed and reverse transmission with differential, \$60; Warner No. 3 differential with sprocket, \$9; complete set of parts to build 2,000-lb. tonneau car, \$600. Auto Parts Co., 52 W. Jackson Blvd., Chicago.

BOOTH'S FELT PACKINGS for repairing automobiles are designed to retain the oil, exclude the dust and tighten loose joints, and are absolutely necessary in connection with ball, roller and plain bearings, hubs and transmission cases, and are made in strips and endless rings of any size and thickness to fit any car; dust rings for the hubs, strips for transmission cases, washers for all lubricating and dust-excluding purposes. I have dies to fit any bearing of any make of car, and can fill any order within twenty-four hours. You will get exactly what you want, and the price will be right. There are so many sizes, no dealer carries a full stock. Write for prices and give dimensions. N. E. Booth, 741 39th St., Brooklyn, N. Y.

ENGINES, axles, transmissions, frames, bodies, carburetors, timers and auto parts generally at bargain prices. Let us know what you want. Logan Construction Co., Chillicothe, Ohio.

BARGAINS in new inner tubes; all guaranteed to hold air. Purchased at special sale.

28x2½	28x3½	30x4	.....\$2.50
28x3	30x3	30x3½	.....3.00
32x3½	32x4	34x3½	.....3.50
34x4	34x4½	34x5	.....4.00
36x3½	36x4	36x4½	.....4.50
36x5			.....4.50

Write for prices on other supplies. We also repair an ymake of tire. All work guaranteed. Chicago Vulcanizing Co., 1400 Michigan Ave., Chicago, Ill.

FOR SALE OR TRADE.—Four sets of Kimball steel tire casings, new; one Prest-O-Lite tank; steel coil and one 1906 single-cylinder Olds runabout. P. P. Pagett, General Delivery, Indianapolis, Ind.

FOR SALE.—300 sets 28x3 best grade artillery wheels fitted with clincher rings, less hubs; write for bargain prices on single sets or the lot. Thomas B. Jeffery & Co., Kenosha, Wis.

FOR SALE OR EXCHANGE, being overstocked: several standard high tension magnetos, also double ignition systems, coil and distributors. Wanted cash offer, or will accept in exchange, any standard tires (sizes wanted, 34x4 and 36x4½), or New Victor Talking Machines. Offer also wanted on a 1909 Continental car, value \$3,500. Full particulars, address "Retired Auto Manufacturer," care The Automobile.

OUR FRICTION TRANSMISSION to transmit 8-h.p. at \$21 is like finding money; other bargains. Send for catalogue. Climax Electric Works, New Salem, Mass.

FORD RUNABOUT owners, now is the time to order our outfit to change your N. S. or R. into new "S" roadster, new fenders, and rumble seats, dash hoods, folding hoods, glass fronts, tops, oilers, magnetos. Write for catalogue to-day. Auto Rebuilding Co., 1349 Michigan Ave., Chicago, Ill.

RADIATORS, hoods, mud guards, metal dishes, gasoline and water tanks. If building or remodeling a car, it will pay you to write us, as we lead in this line. Auto Sheet Metal Works, 2230 Michigan Ave., Chicago, Ill.

SIX CYLINDERS, \$1.50; four cylinders, \$1; two cylinders, 50 cents, is all you have to pay for the most indispensable auto tool made, "The Trouble Finder." When put on the spark plug, you can tell if your timer is in the right place; you can tell which cylinder is not doing its work, caused by leaky valves or a faulty spark plug. Works the same on dry cells, storage or magneto. A good investment for the owner, chauffeur and the repairman. Sent prepaid for stamps, check or currency. Sallander Auto Co., Fort Madison, Iowa.

SPECIAL LOT supplementary springs, wind shields, storage batteries, tire treads, repair kits, boots and patches. Factory prices. Auto Economy Co., 1426 Michigan Ave., Chicago.

SPECIAL lot 1909 Schebler Carburetor outfits, complete for Reo, Ford, Buick, Maxwell, Cadillac, and other cars; more power, easier starting, better control; \$10.75 to \$18 complete. Jenkins Specialty Mfg. Co., Sumter, S. C.

STEVENS-DURVEA repair parts.—15 per cent. discount. C. D. Snow, 62 Glenham St., Providence, R. I.

TIRE BARGAINS.—25 sets 36x3½, 5 sets 32x4½ Dunlop Universal tires; also several sets Clincher tires, millimeter sizes, plain and Midgley tread; all first-class goods; excellent value. C. A. Leonard, 691 Park St., Hartford, Conn.

TIRES, TIRES.—We can sell any make, any size or style tires or tubes for less money than any dealer in the United States. Do not buy until you get our prices. Send for complete list. Excelsior Tire Company, 1777 Broadway, New York City.

TIRES.—New goods, new goods, 1908 stock.

28x2½	.....\$9.00	28x3	.....10.00
30x3	.....11.00	34x4	.....20.00
30x3½	.....13.00	30x4	.....17.50
32x3½	.....16.00	32x4	.....19.00

Mail orders filled promptly. We ship goods to every part of the globe. Anchor Tire Co., 88 Chambers St., New York City.

UNTIL FURTHER NOTICE, runabout tops, \$20; touring car tops, \$35. C. G. Meyer & Son, Tiffin, Ohio.

WE OFFER GENUINE BARGAINS in five-passenger touring bodies, finely upholstered and finished in Brewster green; illustrations and dimensions sent on request. Berkshire Automobile Co., Pittsfield, Mass.

(Special Notices continued on page A-7.)

(Special Notices continued from page A-6.)

1-2 CYLINDER Splittorf coil, new, \$8; 2-4 cylinder Splittorf coils, new, \$15; three Extra Units, new, \$4 each; two Six-Forty storage batteries, \$6 each. John W. Frey, 722 Main St., Buffalo, N. Y.

4 28x3 WOODWORTH TREADS, second-hand, in good condition, at \$3 each; 1 Rambler surrey body, black upholstering, olive green paint, new, \$75; 1 brazing furnace, with Bunsen burners, etc., at \$50; 1 second-hand starting box, and 1 second-hand rheostat, made by Elektron Mfg. Co., 230 volts, at \$6 each. E. S. Youse, Reading, Pa.

1000 MICA SPARK PLUGS, guaranteed or money refunded; 75 cents each, postpaid. Robert Instrument Co., 58 Shelby Ave., Detroit, Mich.

10000 WRAPPED thread inner tubes in stock, brand new. Price, \$3 each. Small sizes, less. 6,000 clincher and quick detachable shoes. Do us a favor and write for prices to-day; will surprise you. A. H. Kasner, 152 Church St., New York City.

1907 LIMOUSINE BODY, built by Rothschild, in France, at a cost of \$3,800; will fit a Packard. Will sell for \$300. Frank Reese Automobile School, 2011 North Carlisle St., Philadelphia, Pa.

Situations Wanted

A POSITION as chauffeur by a young man of 28; competent, honest and strictly temperate, with 14 months' experience repairing and driving; gasoline car preferred. Address "Vermont," care The Automobile.

A S SALES MANAGER, factory representative or salesman for New England territory preferred, with Boston headquarters, handling automobiles or accessories. Will make change shortly. Fourteen years' successful experience with A-1 record. Salary and commission basis. H. S. C., care The Automobile.

BROAD GAUGE man, with large automobile experience on high-grade work, capable of taking entire charge of coach end, will consider change; good opening with some reputable automobile company preferred. Would like personal appointment at either New York Show. Address "Executive," care The Automobile.

CHAUFFEUR and repairer, American, five years' experience; references. Address "P. L. R.," care The Automobile.

DESIGNER and engineer desires to change position on February 1. Have eight years' experience in construction and design, six years in active practice; member S. A. E.; am familiar with modern machine shop methods and my work will be clean and thorough in design, up-to-date in every respect and suited to rapid and economical production. Will furnish partially finished drawings of medium price four-cylinder car. Will attend both coming New York shows and would like personal appointment at either. Address "Auto Designer," care The Automobile.

Help Wanted

AGENTS.—A new invention, Cling-tight storm apron, holds lap robe around you; keeps wind and water out and comfort in; perfect freedom for hands and feet to drive an auto; put on or off instantly. Sent on approval. Beebe-Elliott Co., 614 Wisconsin St., Racine, Wis.

MEN.—Wanted, ambitious and energetic men to learn to repair and run automobiles; home study course if desired, or we will pay your railroad fare to Philadelphia and two weeks' board; easy payments; good pay when competent; free booklet. Automobile School, 752 South Broad St., Philadelphia, Pa.

RAPID and accurate designer and detailer, by large Chicago Auto Manufacturing concern. Steady work and good salary; state previous experience. Address Box 111, care The Automobile.

SALESMEN.—In New York and New Jersey by the Dayton Airless Tire Co. Prefer men who own cars. 1966 Broadway, New York.

THOROUGHLY COMPETENT foreman for trimming shop for automobile factory. No attention paid unless experience, references and salary to start are stated. Address X. Y. Z., care The Automobile.

WANTED AT ONCE.—Man to take charge of an up-to-date garage handling Studebaker cars only, in a city of 12,000 inhabitants; must have five years' experience on all makes of cars; no one need apply without excellent references; man from some factory preferred. Address Eclipse Garage, Box 584, Wilson, N. C.

Insurance

INSURANCE for automobiles.—Broad, safe policies at lowest prices; insurance against fire, self-ignited explosions, transportation hazards, theft, etc.; best services guaranteed, no matter where insurer is located. For particulars address H. W. Beals, 76 William St., New York City. Phone, 3052 John.

Auto Schools

AUTOMOBILE ENGINEERING by correspondence. Course prepared by A. L. Dyke, first auto supply man. New system with mechanical charts. Course, \$10. Something new. Free pamphlet. Investigate. Dyke's Correspondence School of Motoring, St. Louis, Mo.

THE AUTOMOBILE SCHOOL of the West Side Y. M. C. A., the largest in the country, begins its fifth year for instruction. Men are trained efficiently in a 4 or 8 weeks' course, with personal instruction in road work, and in small group classes in shop work. Send for catalog. 310 West 57th St., New York City.

Miscellaneous

AUTOMOBILE TIRES, rebuilt, retreaded, relined, rim cuts and blowouts repaired, inner tubes repaired and respliced; all work thoroughly tested before shipment and fully guaranteed. Thomas Rubber Vulcanizing Co., 227 South St. Joseph St., South Bend, Ind.

AUTOMOBILISTS, ATTENTION!—A grand pair of cinnamon bear robes, \$30; cost \$200; fur-lined coat, lined throughout with the best Australian mink, Persian lamb collar, sell for \$35; cost \$150 in Montreal. Call or write J. Loew, 520 West 145th St., New York City.

COIL REPAIRING.—Ship your coils. We repair them at the lowest expense and guarantee our work for two years. Our unexcelled facilities enable us to do this. "We do things here." Marinette Electrical Repair Co., Marinette, Wis.

CRATE for Packard touring car for sale. Any one expecting to tour Europe will do well to consult C. L. Candee, Princeton, N. J.

FOR SALE.—4-h.p. Mitchell motorcycle, brand new. Only \$68. Comet Motor Works, Madison and Canal Sts., Chicago.

FOR RENT.—Two large two-story stone buildings, north side of Cambridge St., west of 39th St., size 95 feet by 58 feet and 60 feet by 81 feet, suitable for automobile garage; will make any necessary alterations. G. Percy Fox, 2524 Girard Ave., Philadelphia, Pa.

IF YOU feel you are paying too much for supplies, write for our catalogue and save money. Agents take notice and write to-day and let us know what cars you sell. Kansas City Automobile Supply Co., 609 A 15th St., Kansas City, Mo.

"NEWMASTIC"—The Airless Inflation for Automobile Tires. Not affected by small punctures. Rides Easy. It Lasts. We refund your money if not entirely satisfied.

What more can you ask? See our exhibit—space 214, Gallery Floor, Ninth International Automobile Show, Grand Central Palace, New York City, December 31st, 1908, to January 7th, 1909. If you cannot come, send for our booklet containing full information.

Newmastic Tire Company, 68th Street & Broadway, New York City, or 302 Michigan Ave., Chicago, Ill.

(Special Notices continued on page A-9.)

TIRES! TIRES!! TIRES!!!

We can sell you any make, any size or style tire or tube for less money than any dealer anywhere in the United States.

We have contracts with the leading makers of automobile tires to sell for them any quantity of surplus stock, enabling us to quote these at 60% to 70% discount from the regular price. Do not buy tires until you get our prices. Bargains in all makes of tires and tubes.

CLINCHERS DUNLOPS

QUICK DETACHABLES

We guarantee these brand new, clean, fresh 1908 stock. This lot includes Morgan & Wright, Ajax, Diamond, Continental, Ennis, Pennsylvania, etc. We are selling the lot while they last.

Size.	Casings.	Tubes.
28 x 2 1/2	\$7.00	\$2.50
28 x 3	11.00	3.00
28 x 3 1/2	15.00	3.50
30 x 2 1/2	8.50	2.75
30 x 3	12.25	3.50
30 x 3 1/2	15.25	3.75
30 x 4	18.50	5.25
32 x 3	10.50	3.25
32 x 3 1/2	16.00	4.00
32 x 4	20.00	5.50
34 x 3	9.25	3.50
34 x 3 1/2	16.00	4.25
34 x 4	22.50	5.75
34 x 4 1/2	23.50	7.50
34 x 5	23.00	6.50
36 x 3 1/2	13.25	4.25
36 x 4	21.50	6.25
36 x 4 1/2	24.00	8.00
36 x 4	23.75	8.25

These prices are only good while our stock lasts, therefore place your order now to get the benefit of our low figures. TERMS are Cash. At the very low price we are selling them, we are obliged to get Cash with order. Do not hesitate to send us money. We are as good as the bank. All C. O. D. orders must be accompanied with 10% of purchase, to cover us on transportation charges.

If you are dissatisfied with your purchase upon receipt of goods, we will refund your money.

Send for Complete List Single Tube Tires

26 x 2 1/2	-	-	\$ 8.00
28 x 2 1/2	-	-	9.00
28 x 3	-	-	11.00

By securing a very large quantity of these goods, we are enabled to quote you these extraordinary low prices.

EXCELSIOR TIRE CO.

1777 Broadway
New York

60,000 READERS

THERE are thousands of automobilists, dealers, supply houses—those who buy and sell, people who are looking for help, people who are looking for work—all ready and anxious to make a deal with you if you have the thing they want.

The main point is to get the attention of this group or class, all in a lump, and minus the enormous amount of waste circulation you may have been buying in daily newspapers.

In putting your classified advertising where it will do the most good for the least money, you must get away from mass circulation in newspapers and get into class circulation in an automobile newspaper.

Meaning in this instance **THE AUTOMOBILE**

a weekly that prints only classified advertising relevant to its chosen field, and sends it weekly to 60,000 interested readers—

That does not bury it in columns of "real estate," "pawnbroking," "help wanted," "dogs lost," "diamonds found," advertising that goes to the homes of, and is read by, about every "undesirable citizen," so far as your sales chances are concerned.

Here's the reason accounting for the rapid fire, quick sales reputation **THE AUTOMOBILE** is making for its advertisers, both general and classified:

It doesn't matter what your wishes may be in this direction,

THE AUTOMOBILE

can bring them about to your own satisfaction, provided you want to reach the motoring public. This weekly paper—

Will sell your second-hand machine, or your second-hand lamp, or tell you where to buy.
It will secure you agents, or get you a job, or furnish you with competent help,
or advertise your school of instruction—

and do these things promptly and thoroughly by going only to the class of people you want to reach, right at the time when they are in the most receptive mood.

At 20c. a line (the rate in **THE AUTOMOBILE**) wouldn't you rather have your classified advertising in the permanently "MUST-BE-SEEN" CLASS than to have it hopelessly lost (at twice the price) in daily newspapers that count twenty-four hours as a ripe old age?

THE AUTOMOBILE

239 West 39th Street

NEW YORK

20 CENTS A LINE

(Special Notices continued from page A-7.)

OLD ESTABLISHED garage for sale; repair business and two well-known agencies; sales per year, about 20 cars; town, 6,000; 20 miles from New York. For particulars address "S. B. H.," care The Automobile.

RADIATORS and lamps repaired by experts. Ship to us and follow with letter. Auto Rebuilding Co., 1349 Michigan Ave., Chicago, Ill.

RUMBLE SEATS and "baby" tonneaus, for Ford, Maxwell, Buick, Cadillac and other cars, fenders, radiators, hoods. We are the big mail-order rebuilding house. Send for catalogue. Auto Rebuilding Co., 1349 Michigan Ave., Chicago, Ill.

SAVE DOLLARS!—Charge and renew old batteries; formula, 10-cent coin. Box 204, Waterloo, Ia.

SHINEBRIGHT METAL POLISH is absolutely the best on the market; sample and quotation furnished upon request. Shove & Gage Co., Inc., Providence, R. I.

STEAM CAR OWNERS—Send for sample of engine and pump packing. R. A. Robbel, 221 East 31st St., Chicago, Ill.

THE AUTOMOBILE HANDBOOK.—By L. Elliott Brookes. Over 10,000 copies sold. This sale guarantees absolute authority. This work was written to supply practical information to automobile owners, operators and chauffeurs, including road, motor, carburetor, ignition, battery, clutch and starting troubles, with information of value in automobile mechanics. Pages, 480. Over 180 illustrations. Leather bound, \$1.50. Frederick J. Drake & Co., 214 Fisher Bldg., Chicago, Ill.

THIS IS THE TIME of year to send in your old tires and have them put in A-1 shape for spring service. We are not the largest, but the best, tire repair company in the country. We also supply and sell all makes of solid vehicle tires; also all makes of new auto casings and tubes. We have on hand a full line of second-hand tires and tubes, at one-third the list price of new tires and tubes. This is not hot air. Give us a trial and be convinced. Chicago Tire Repair Co., Michigan Blvd. at 35th St., Chicago.

TIRES REPAIRED.—Automobile owners, do you want your tires repaired or recovered by the people who know how? Give us a trial and be convinced. Inner tubes vulcanized at short notice. Jungkind & Vogler, 158 Chambers St., New York City. Telephone, 3286 Cortlandt.

U-AUTO POLISH will keep the varnished parts of your automobile or carriage in excellent shape. Address Shove & Gage Co., Inc., Providence, R. I., for sample.

TIRES REPAIRED and retreaded.—All work guaranteed. We have the largest and best-equipped tire repair shop in the West, and experienced men do the work. Best materials and workmanship only. A complete line of Morgan & Wright tires carried in stock. Auto Tire Co., agents Morgan & Wright, 605-7 East 15th St., Kansas City, Mo.

TIRES.—Model Vulcanizing Co. tires. Have your tires repaired and vulcanized by reliable experts. All work guaranteed. Let us save you money on new tires. We repair all types of Clincher motor cycle casings and tubes, and also repair and apply solid vehicle tires. Our motto: Right and reasonable. Model Vulcanizing Co., 1547 Michigan Ave., Chicago, Ill.

TWO TWIN-ENGINE Indian Motorcycles; one 8-horsepower Minerva. H. E. Coryell, rear 353 Main St., East Orange, N. J.

Protect Your Automobile Improvements with Solid Patents

We can handle your business properly, as we are familiar with all types of Autos, are automobile owners and have had twelve years practice before the Patent Office. Send sketch of your invention for free report as to patentability. Book "How to Obtain a Patent" and "What to Invent" sent free.



Chandlee & Chandlee
Patent Attorneys
903 F Street
WASHINGTON, D. C.

Wind Shields \$21

Folding Shield, brass bound, plate glass.

Complete Brass Fittings, guaranteed.

Runabout tops \$18.00 and \$20.00.

Complete Curtains and Rail.

Guaranteed to fit Ford, Maxwell and Olds. Description on application. Chicago Auto Top Co., 80 W. Jackson Boulevard, Chicago.

"K. C."

"Kitsee Changeable" DRY STORAGE BATTERY

WOULD A SPARKING BATTERY WITH A LIFE GUARANTEE

INTEREST YOU?

Would you like a battery that you could exchange when discharged for a fully charged battery with any dealer, regardless of where purchased, by paying 35 Cents per Cell and without the annoyance of delay? Then ask your dealer about it or write us.

SEE OUR EXHIBIT At MADISON SQUARE SHOW

JAN. 16-23, 1909

EBEN L. BEVAN, Gen'l Sales Agent

KITSEE STORAGE BATTERY CO.
629 Connell Bldg SCRANTON, PA.

SUBSCRIBE FOR THE AUTOMOBILE WEEKLY—\$3.00 PER YEAR

At 20c. a line (the rate in THE AUTOMOBILE) wouldn't you rather have your classified advertising in the permanently "MUST BE SEEN" CLASS than to have it hopelessly lost (at twice the price) in daily newspapers that count twenty-four hours as a ripe old age? THE AUTOMOBILE, 239-241 West 39th Street, New York.

The Wyman & Gordon Co.
DROP FORGINGS
WORCESTER MASS. FORGED WITHOUT WELDS CLEVELAND OHIO

DROP FORGING
SPECIFY! NOW FOR 1909 FORGINGS
Our new plant is fully equipped and in operation. Send blue prints or models. We quote prices.
Page Storms Drop Forge Co., Chicago, Mass.
See our display advertisement first issue of month.

Headquarters of the Automobile Club of Cincinnati
FAVORITE WITH AUTOMOBILISTS
GIBSON HOUSE
CINCINNATI, OHIO
THE A. G. CORRE HOTEL CO.
CORNELIUS A. BURKHARDT, Pres. and Gen. Mgr.
European Plan. Every modern appointment, combined with all the comforts of home.
Fourth and Walnut Streets
In the Center of Everything

"ALL STEEL"
The B & S "All Steel" Screw Driver—new and improved—complete in one piece—drop-forged of steel throughout with carefully tempered point. A specially designed handle for insuring positive and easy grip.
Nothing to get out of order—SIMPLE, LIGHT, EFFECTIVE and DURABLE. Made in eleven sizes—including two of heavier model, with square shank for the application of a wrench. Write for prices. **THE BILLINGS & SPENCER CO., Mfrs., Hartford, Conn.**
THE MARK OF QUALITY
THE BILLINGS & SPENCER CO. HARTFORD

FULL LINE OF PRESSURE GAGES FOR GASOLINE, AIR, WATER OR STEAM ALSO POP VALVES AND COCKS



THE ASHTON VALVE CO., 271 Franklin Street, Boston, Mass.



The A.B.C. of
Dust Proof Oil Hole
Covers, learned in
the school of ex-
perience. Get busy,
join the class.

C. F. TUCKER Hartford, Conn.

C. COWLES & CO., New Haven, Conn.

We will exhibit at the Grand Central
Palace, space 149, section "S," gallery
also at the Madison Square Garden,
Concert Hall, space 319.

Don't fail to see our particularly
interesting Exhibit of Novelties.

C. COWLES & CO., New Haven, Conn.



**National Speed
Indicators**

PLAINEST READING
INDICATORS MADE

PRICES \$20 \$25 \$30 \$50

Write for information.
Special inducements
to dealers.

National Speed Indicator 147 Columbus Ave., Boston, Mass.

Complete Course

Automobile Instruction

Invaluable to the owner or prospective
owner of a motor car

Practical and to the Point

Send for Prospectus to the
Correspondence School of Motor Car Practice,
Tarrytown, N. Y.

LIFE

is the greatest medium for selling Automobiles and Accessories.
I have figures which prove my claims. Address,

George B. Richardson, Manager Advertising Department,
LIFE PUBLISHING CO., 19 W. 31st St., New York City

CANDY CARBIDE

Trade Mark

No more trouble with generators. Sold only in
10 lb. cans, with green labels. Price \$2.00 each,
from all Auto Supply Houses. A 10 lb. can, 5"x12",
will make gas enough to fill up two of the largest
gas tanks in the market.

ACETYLENE GAS ILLUMINATING CO.
405 Broome Street, New York

TRY VICTOR CLUTCH COMPOUND FOR A SLIPPING CLUTCH

MANUFACTURED BY

VICTOR CLUTCH COMPOUND CO., NASHUA N. H.

\$25.00 Reward!

For the best Automobile Anecdote. We are
compiling a book for use of After-Dinner Speak-
ers and could use a few true (?) stories. The
money will be paid in four prizes—\$10.00 for
the funniest in fewest words, \$5.00 each for the
three next best stories.

Please send or hand your jokes into the office
of this hotel on or before January 20, 1909.

One free copy will be mailed to each contribu-
tor whether he or she wins or not.

The Grand Hotel

George F. Hurlbert, President

31st St. and Broadway

New York



Comfort without Extravagance

Hotel Woodstock

127 West 43rd St., New York.

M. H. Valiquette, Manager

Rooms, with bath, \$2.50 to \$3.50
Suites, \$5.00 to \$6.00

TIMES BUILDING

TIMES SQUARE

HOTEL WOODSTOCK

AUTOMOBILE SCHOOL

West Side
Y. M. C. A.

310 West Fifty-seventh Street, New York City

TELEPHONE, 3800 COLUMBUS



INDIVIDUAL ROAD LESSON

Gives Students
as near as possible
INDIVIDUAL
INSTRUCTION

This School is
Endorsed by the
Leading Auto-
mobile Clubs and
Manufacturers



PRACTICAL SHOP WORK IN SMALL GROUPS
An Instructor for each group

DAY AND NIGHT CLASSES
CALL, 'PHONE OR WRITE FOR CATALOGUE

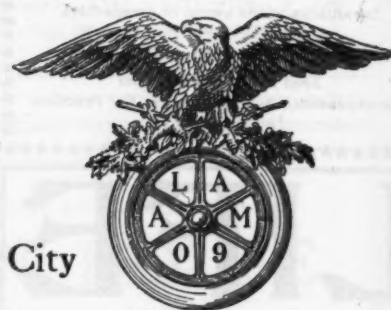


Ninth National Automobile Show

Madison Square Garden

January 16 to 23, 1909, New York City

Under the Auspices of the



Association of Licensed Automobile Manufacturers

Exhibiting standard Gasoline Cars licensed under the Selden patent

LICENSED GASOLINE CARS

Apperson	Columbia	Hewitt	Packard	Royal Tourist	Stevens-Duryea
Autocar	Elmore	Knox	Peerless	Sampson	Studebaker
Buick	E-N-F.	Locomobile	Pierce Arrow	Selden	Thomas
Cadillac	Franklin	Lozier	Pope Hartford	Simplex	Walter
Chalmers-Detroit	Haynes	Matheson	Pope Toledo	Stearns	Waltham
Corbin					Winton
Anderson	Bailey	Champion	General Vehicle Co.	Studebaker	Woods
Babcock	Baker	Columbia	Rauch & Lang	Waverly	

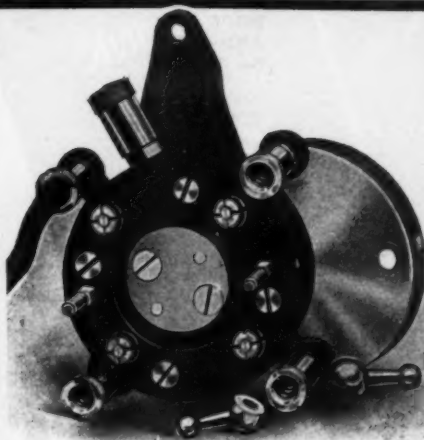
ELECTRIC

STEAM
White

Complete exhibit by the Motor & Accessory Manufacturers. The only complete Motorcycle exhibit in New York, by the Motorcycle Manufacturers' Association, Commercial Vehicles, Town Cars and Taxicabs.

BUYING IGNITION MATERIAL IS A MATTER OF CONFIDENCE

HERZ IGNITION MATERIAL HAS BEEN THE **BEST** THESE LAST FIFTEEN YEARS—No Experiments



HERZ BALL-BEARING TIMER

The One Always Dependable and Reliable Circuit-Breaker Tool Steel

vs. Tool Steel

No Looking After No Repairs.

Over 100,000 in Constant use.

Saves 25% on Gasoline.

Runs Packed With Grease.

See the 12 Different Types at the Shows.

HERZ Distributor

The Smallest, Most Compact Instrument Made.

With a Single Coil and 4 Plugs, it gives the Most Complete and Reliable Ignition Outfit. Double Ball Bearing. Spring Ball Connections.

No Experiment. A Tried Out Device.

The Ideal Outfit for Double Ignition, 2, 3, 4, 6 Cyl.



"UNIVERSAL"

A FRICTION DRIVEN

POWER PUMP.

GEARED DOWN.

SOLE LEATHER

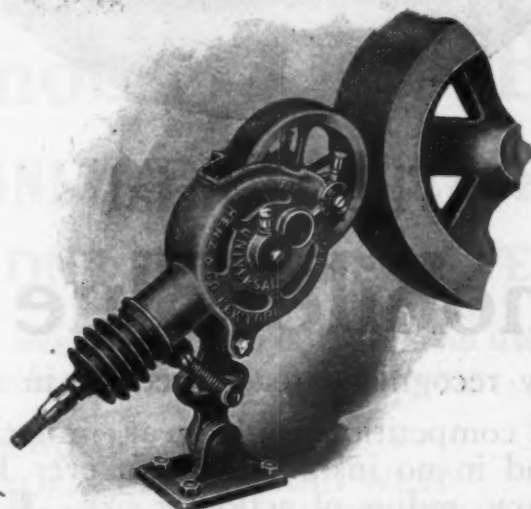
COVERED

FRICTION

WHEEL.

AUTOMATIC INLET,

BALL DELIVERY VALVE



"UNIVERSAL"

PISTON RINGS.

NO LEATHER.

PUMPS UP

TIRES.

PUMPS UP

TANKS ON

POWER BOATS.

PRICE, \$20,

WITH BRACKETS.



HERZ'S PATENT HAND-LEVER FRICTION PUMP "TANDEM"

Ten Years Ahead in Pump Construction

TO SEE IT MEANS TO BUY IT AN ABSOLUTELY RELIABLE POWER-PUMP KEPT IN YOUR TOOL BOX. PISTON RINGS MADE TO LAST. DRIVEN BY FRICTION FROM THE FLYWHEEL OR ANY OTHER PART OF CAR. PUMPS UP THE LARGEST TIRE IN FROM 3 TO 5 MINUTES.

THE NEW IMPROVED PATTERN, PRICE, \$20.

HERZ PLUG

"Bougie Mercedes."

The Best and Most Reliable Plug Made. The Double Stone Insulation Alone Puts It Into a Class Far Above the Best Porcelain Plug.

Porcelain Cracks, This Stone Never. ABSOLUTELY GUARANTEED FOR ONE YEAR.

Absolutely Self-Cleaning.

Absolutely Proof Against Soot or Oil, Needs Never Be Taken Out of Motor.

THE BEST VALUE IN SPARK PLUGS

EVER OFFERED. POSTPAID, EVERYWHERE, \$1.50.



SEE THE
HERZ MAGNETO
AT THE SHOWS
A REVOLUTION AND—A REVELATION

HERZ & CO. Civil Engineers 203-205 Lafayette St. NEW YORK

FREE—OUR "GOLD BOOK OF IGNITION"—WRITE FOR IT—FREE

Largest Stock of Asbestos-Copper Caskets in America 1200 Sizes



THE BLUE
BOOK CAR
AND CREW
No. 2

The Official Automobile Blue Book

is the only recognized road directory in America.

¶ It has never had competition—only weak imitations and incomplete copying—and in no instance has it ever been approached in point of accuracy, radius of action or size. ¶ The Automobile Blue Book has a staff of trained map makers and routers, who are almost constantly upon the road, extending routes, simplifying detail information and improving and enlarging the volumes. ¶ We show here a reproduced photograph of one of the Blue Book cars, which alone has covered nearly 40,000 miles. ¶ This is just to illustrate the fact that all sections of this road guide are mapped, mile after mile, right from the cars, by men who know how to do it. ¶ If you contemplate touring this summer, send your order NOW for any section or sections noted on the opposite page.

Price \$2.50 per volume.

The Automobile Blue Book

231-241 West 39th St.

NEW YORK



The Official
Automobile Blue Book
AMERICA'S ONLY RECOGNIZED ROAD GUIDE
"THERE'S ONE IN NEARLY EVERY CAR"

Now in use by over 25,000 Tourists who use it to simplify and make pleasant the selection of routes covering:

NEW ENGLAND STATES
NEW YORK, CANADA AND WEST
NEW JERSEY, PENNSYLVANIA, SOUTH AND WEST
MIDDLE WEST.

Gives the best and most popular through and local routes, best hotel and garage accommodations, and full running directions and maps for nearly every route published.

IN 4 VOLUMES COVERING 73,000 MILES.
HANDSOMELY BOUND IN LEATHER.

PRICE PER SECTION, **\$2.50.**

SEND YOUR ORDER NOW—THE TOURING SEASON
APPROACHES.

THE AUTOMOBILE BLUE BOOK

231-241 WEST 39th STREET

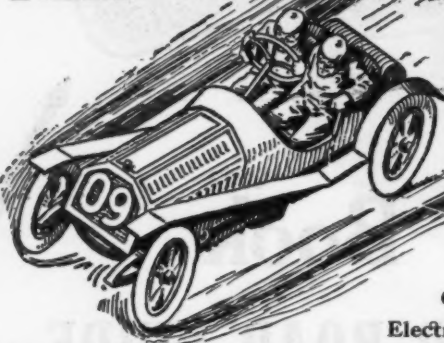
NEW YORK

OPENS NEW YEAR'S EVE

DECEMBER 31st to JANUARY 7th

Leading American Cars—All the Foreign Cars direct from the Paris Salon—All Accessory Makers

Only exhibit of Foreign Cars in America



Gasolene—
Electric—Steam

9TH INTERNATIONAL AUTOMOBILE SHOW

Management of
American Motor Car
Manufacturers' Association

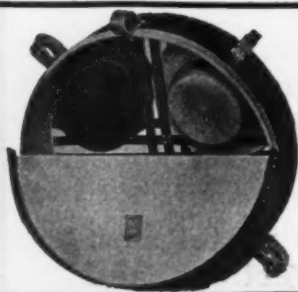
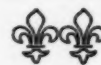
GRAND CENTRAL PALACE

FORTY-THIRD ST. AND LEXINGTON AVENUE, NEW YORK
Admission, 50c.; Tuesday, \$1.00



Construction of a Gasoline Motor Vehicle

By C. C. BRAMWELL. Contains 150 pages, 6x9; one hundred illustrations and diagrams. Publisher's price, \$2.00; our price, 50 cents. Address Book Department, The Automobile, 231-241 West 39th St., New York.



AUTO TRUNKS

SINGLE

DOUBLE

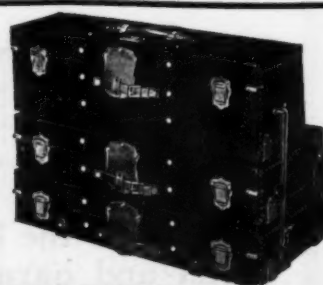
TRIPLE

AND WITH INSIDE CASES
ICE, WINE AND LUNCH TRUNKS

Write for Auto Catalog

W. W. WINSHIP, 73 Summer St., BOSTON, Mass.

"Boston's half-century baggage maker"
Round trunks for ladies' or gents' hats, or inner tubes, etc. Fit inside extra shoe



The SYRACUSE" Special Auto and Boat Chemical Fire Extinguisher



Not Necessary to Remove Bottle from Bottle Holder when Recharging. Saves Time. No Danger of Burning Hands with Acid. Both Very IMPORTANT FEATURES in the Construction of a Chemical Fire Extinguisher.

will extinguish gasoline (or any other) fire instantly. The ONLY chemical hand extinguisher which is specially designed and practical for use aboard the auto or yacht. "The Syracuse" is not affected by heavy seas. Rough Roads have no effect on "The Syracuse."

Expensive fire insurance will not save life and property.—"The Syracuse" will do both at small expense.

It is absolutely certain to operate every time.

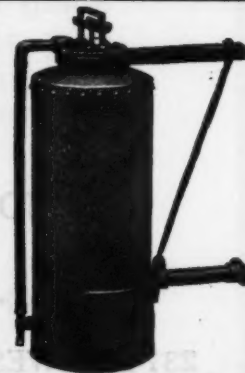
Write for full information and prices and special discounts to dealers.

The SYRACUSE CHEMICAL FIRE EXTINGUISHER CO.

Sole Manufacturers.

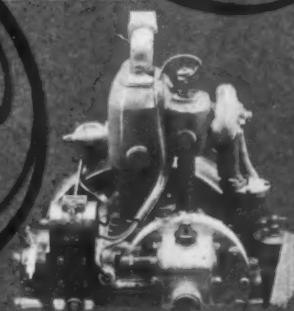
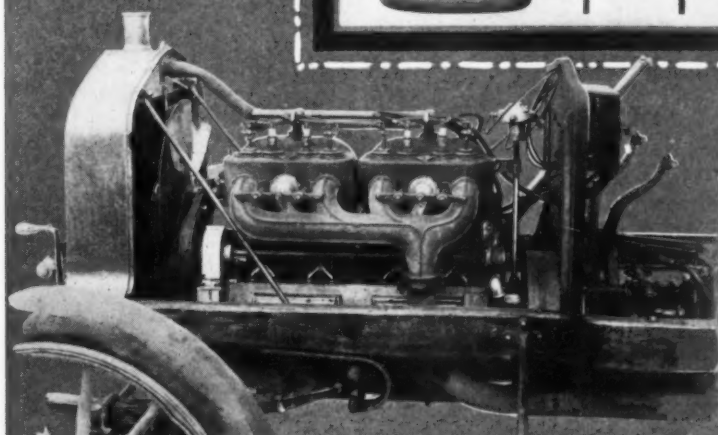
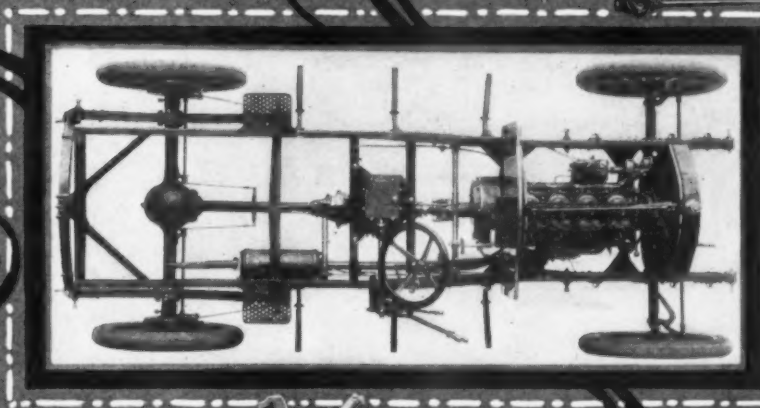
Factory and General Office:

100 West Fayette St., Syracuse, N.Y., U.S.A.



Special Auto and Yacht Extinguisher with Adjustable Holder

Power Plant Section



INCLUDING

Carbureters, Crankshafts, Crank and Gear Cases, Transmission Gear Sets,
Cooling Systems, Mufflers, Protecting Aprons, Hoods, Cylinders, etc.

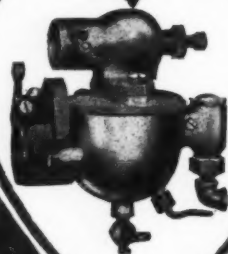
A Word in Season to the MANUFACTURER DEALER and USER

To-day old 1908 goes into the archives of the past, and in its passing it is not remiss to remind you that the big successes of 1908 were the cars equipped with

SCHEBLER CARBURETER

"SCHEBLER" has always led—it leads to-day—and will lead to-morrow—and as you get busy with the business of 1909 remember that "SCHEBLER" Carbureter is the greatest and most important one thing

conducive to the success of your 1909 cars; that will make them most salable—easiest to operate and absolutely dependable. Carbureters come and Carbureters go, but the ONE Carbureter that stays, that never disappoints, that is always reliable—that always wins—that increases in popularity—is the much talked of "SCHEBLER."



A car, no matter how costly, is wholly dependent upon its carbureter for its successful operation.

So it behooves the makers of cars, as they value their reputation, to use the best that can be had, and it is always better to adopt a tested and proven device, than to fuss and tinker with experiments. The one carbureter no manufacturer can ever make a mistake in adopting is the

SCHEBLER CARBURETER

It is the Standard of the World and should be on your 1909 cars.

This Week We Are Exhibiting
at

Grand Central Palace, N. Y.
Ready and Willing to Prove the
Overwhelming Superiority of

SCHEBLER CARBURETER

See us personally if you can or write for full
information to

WHEELER & SCHEBLER
MANUFACTURERS
INDIANAPOLIS, IND.

Sales Offices: Factory Sales Corporation, 235 Randolph Street, Chicago. New England Office: W. J. Connell, Mgr., 36 Columbus Ave., Boston, Mass. Eastern Office: E. J. Edmond, Mgr., The Motor Mart, 62nd and Broadway, N. Y. Canadian Office: John Millen & Sons, Ltd., Montreal, Vancouver, Toronto.

For sale at any reliable dealer in Automobile and Marine Engine Supplies.

Q
di
th
pa
th
in
gr
is
imp

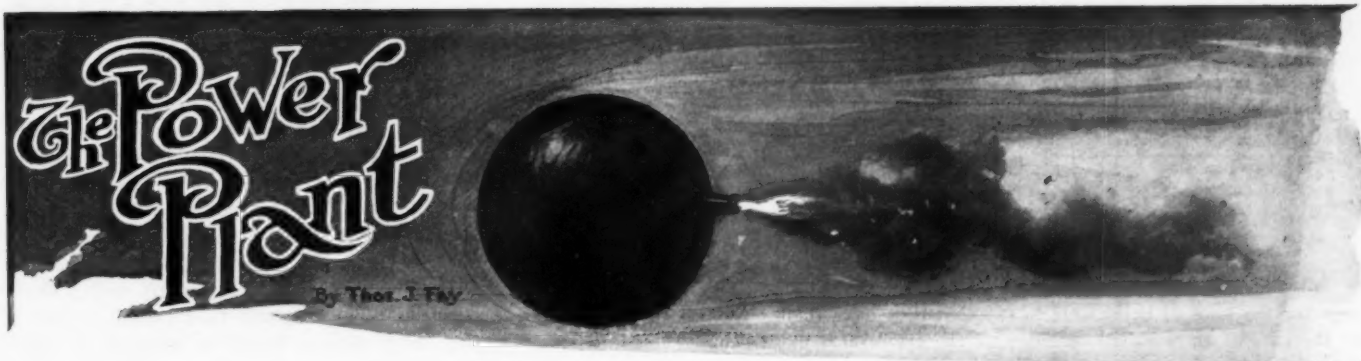
loc
ra
cy
ma
Th
be
of

fac
mo
dif
eve
wh
cer

con
thi
fin
of
pli
cos
wh

7
div
the
tio
den

pro
of
qui
can
wa
sun
not
exa
sta
wa
the
cha
the
I
nee



CANDIDLY, the progress made within the last year by way of improvement in the power plants of automobiles was so diversified and in many ways so given to detail as to preclude a thorough attempt at reiteration. There were no radical departures from the beaten paths, however, nor evolutions beyond the pale of conservative practice. The several types of motors in their respective spheres of influence maintain that sturdy and growing importance which is servile to lawful manipulation, and is more nearly invincible to re-occurring and unpleasant happenings than even the most optimistic might have anticipated.

At the beginning of the year the single cylinder motor was looked upon somewhat less favorably than its true merit warranted. The double opposed motor was threatened by the four-cylinder type, and the four, in turn, seemed crowded by the many and undeniable advantages of its flexible neighbor, the six. These apparent controversies proved as chaff before the wind—to be forgotten—in the demand for cars, typical of each of the types of power plants and characteristic advantages.

It seems assured that further experience has established the facts that the earlier defects incidental to the several types of motors were due to vagaries of design, faulty materials and indifferent construction. This last year was one of noteworthy events, due in a measure to the threatening financial situation, which, however, augured for good, in that it produced the incentive ending in a thorough house cleaning.

The live concerns eliminated the faults of which they had become cognizant, revised their methods and evolved among other things power plants for their cars that would seem to spell finality. The earlier complaints were duly weighed, the question of the duplication of parts was rendered more nearly an accomplished fact, and the production of repair parts, both in point of cost and utility, were afforded the due measure of attention to which they were entitled.

The Trend of Motor Improvement.

To fully appreciate the situation it will be necessary to subdivide the power plant and discuss the respective features by themselves. The motor, for illustration, as an abstract proposition, can receive treatment, irrespective of the number of cylinders, since the question of improvements will be the same.

Cylinders Were Perfected.—From the start the cylinders proved to be rather troublesome, and it is to the everlasting credit of the makers of cars that they finally produced motor cylinders quite as free from troubles of any sort as any reasonable person can possibly expect. The improvements did not take root by way of adding weight, indeed; the whole situation can be summed up by saying *they added quality instead*. But this was not an easy matter; the foundries had to be educated up to the exacting requirements, and in the earlier times they refused to stand for the ducking, excepting at a price, which perspicuity was not with a definite assurance from them that the quality of the cylinders would be up to a fitting standard. Time wrought changes, and the last year was the one of marked advances, from the foundry point of view.

In the meantime, patterns were more nearly in accord with the needs of the occasion, and between the more suitable pattern

work, the better foundry practice, and the clearness of precision of designers, cylinders were produced in quantity, of great strength and suitable for their respective purposes, whether they were to be water cooled or by an air draught instead.

Crankshafts Are Die Forged.—It was just about a year ago that the crankshaft question was most agitated, for then it seemed inevitable that slabbing would have to be resorted to, in order to make crankshafts of the quality demanded in service. In the meantime, the threatened invasion did have its effect, and the drop forging interests made experiments leading up to what is now commonly termed *toughened drop forgings*, in which the materials have properties imparted to them by special heat treatment, such as were never before known to the automobile or any other industry.

The process was found to be most exact, cheapening in its trend, and fortunately propitious in the time of its coming. This process lends itself equally to such other parts as connecting rods, cam shafts and multitudinous small parts, of which automobiles seem to have a liberal share.

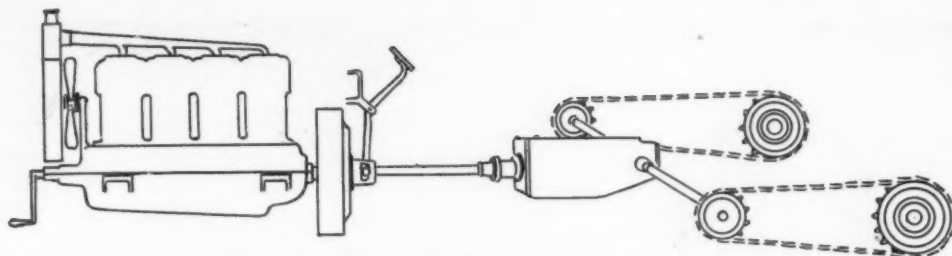
Crankcase and Bearings Related.—Strides have been made in the testing of aluminum, thus rendering it safe and profitable to employ this light and, on the whole, very desirable metal in work of this character. This improvement is one of the distinct advances of the year. In earlier times the aluminum castings were good in the main, but they were not used by some of the makers of cars, because manganese bronze is considerably stronger, but it is considerably heavier as well.

It will be proper to discuss the question of bearings in connection with crankcases, since a bearing *per se* would be of no utility, without a resting place of considerable stability. It matters not at all if the bearings are the one or the other of the available types, when reference is had to alignment, and during the last year this problem was solved to a double purpose. It was noise that brought about the change, for in trying to eliminate noise it was discovered that thin castings defeated the project, in that they were largely responsible for much of the remaining noises in cars, as they were a year or so ago.

To thicken the walls seemed to be a necessity, and this thickening process was of course possible, in view of the very light weight aluminum and, too, in view of the extended use of die (drop) forgings, in that the noises were subdued, and the bearings were kept in more perfect alignment, since the increased thickness of the shell resulted in increased rigidity of the bearing supports and absence of trouble.

Ball and Roller Bearings.—It was pointed out how the process of eliminating noise resulted in a more stable housing for the bearings. In relation to the bearings, it might be well to observe that the tendency is in the direction of ball and roller bearings up to the limit of the ability of designers to eliminate plain bearings, with their shorter life.

That designers have pursued a sensible and conservative course is rendered manifest by an inspection of the cars of the year; they have not, for illustration, attempted to put ball or roller bearings on connecting rod bearings. When it comes to crankshaft main bearings, they have been guided by broader considerations than the mere question of the utilization of ball bear-



Outline Design of Typical Side Chain Drive Power Plant.

ings for the sake of being able to say that they have them. Such of the cars as employ ball bearings on the crankshaft main bearing position were evidently justified in taking advantage of the excellent qualities afforded. In the types of motors involving plain main bearings for the crankshafts, there were considerations that outweighed the advantages of ball bearings, and the finer qualities of main bearings were employed instead.

When it comes to the transmission gearset, there are few or no examples of plain bearings. The spindles are centered in nearly every case on either ball or roller bearings. When ball bearings are found, they are almost invariably of the radial type; and when it comes to roller bearings, they are largely of the conical type.

Likewise in the axles, the plain bearings are scarcely to be seen at all, while the ball and roller bearings are in great profusion.

The Principle of the Three-Point Suspension.—This principle has been extended during the present year to include cars in general. The question of bearing alignment was a strong argument in favor of resting the power plant units on three points, or the equivalent, instead of depending upon the rigidity of the side frames. The mode of the application of the principle is not the same in all cases, but the dominant idea is uppermost in each of the several examples. In some cases the uninitiated would fail to discover the principle of the three point suspension, because in resting the units on more than three points there is an apparent diversion from the principle involved; and the uninitiated would fail to discover that *rigid ties are limited to three points only*.

Speed vs. Power.—In the old days, motors were run at a low speed, and the power was a minimum for a given weight. Gradually the question of increasing speed took a hold, and within the last year this matter was crystalized into short stroke high speed motors, in which the weight efficiency is very high indeed. Remarkable as it may seem, the fuel consumption diminished considerably, although some forecasts were to the opposite view.

The short stroke motors are light; the strength of the component parts would naturally increase because in such motors the parts are short and relatively thick. The deflections diminished and the mechanical efficiency increased as a natural sequence. The mere decrease in the length of the stroke did not at first promise so much as after events disclosed. On second thought it would have been rendered quite plain that increased mechanical efficiency would follow any increase in rigidity, since the way to make a thing rigid is to make it short and thick.

Valves and Timing.—While it is true that the valves are not made of greater area than of the previous practice, it is equally true that the relation of the areas of valves to the areas of cylinders has undergone a change. This change in relation is assignable to the fact that the bore of the modern short stroke motor for a given power is less than the bore as is obtained under the old conditions, but in reducing the bore of the cylinders a corresponding reduction in the area of valves did not follow, hence the change in relation in favor of an increased volume of mixture or power and better cooling conditions.

Dual Ignition Systems.—The new products are so thoroughly fitted out with ignition devices as to preclude any change of justly conducting any of the old line of strictures. The magnetos of the present time are thoroughly scientific, well made

and deliver a spark of great energy at the proper instant. They serve every purpose required of an electrical system, excepting for lighting, and it is to be regretted that the magneto system does not seem to lend itself to this important matter.

It is almost unnecessary to point out that the "rotor" of the magneto must change in speed because the magneto must synchronize with the speed of the crankshaft, which shaft

rotates at a variable speed. The magneto then cannot deliver a constant electromotive force such as would be required in lighting work. A speed regulator is complicated.

The direct current system of ignition, using a small dynamo, is of course available for the double purpose and is preferred by many on that account. In these days, with the new types of coils, equipped as they are with the "master vibrator," the petty objections to coils are wiped out, and the direct current systems more nearly lend themselves to the problem than ever before. In conjunction with the coil systems, the modern storage batteries make combinations a good second to the magneto, and most cars are fitted out with the dual system. In some cases, because of the splendid advantages of the master vibrator, in conjunction with the coil system, it is the practice to use the storage and the dry cells to the exclusion of the magneto. This scheme is reliable, economical, and the first cost is the minimum for good results.

The Fuel Systems.—At the beginning of the year the question of alcohol was *hot off the grid*, but gasoline is the fuel upon which reliance is placed, with small chance of a change for some time to come. As long as gasoline can be had it will well serve the purpose, and its price will have to more than double perhaps to afford other fuels a chance to compete.

It is pleasant to note that the cars of the present date are fitted out with good and sufficient copper gasoline tanks, of excellent workmanship, involving sweated and riveted joints. It is also observed that, as a rule, a water pump is provided, and baffle plates are placed to prevent the surging of the gasoline in the tank. The fastenings of the tanks are also strong and securely placed, as they should be.

Piping and Fittings.—The new cars, without respect to price, are provided with suitable gasoline piping, which appellation can well be applied to the oil and other piping in and about the cars of the present time. The chances of a stoppage are remote, and the strength of the piping is well within bounds. The fittings are strong, light, tight and of the ground joint class; one may quickly remove a section and, after blowing the same out, replace it without fear that a tight joint will not be made.

Carbureters Reduced to Practice.—The float feed type is still with us, carrying many improvements, mostly in point of detail, to be sure. The trappy, loose jointed and mysterious affairs, once the master of us all, can no longer be found on automobiles. Under the new conditions the needle valves, for illustration, are more nearly tight, and flooding is controllable.

The copper or cork floats are nicely constructed, not likely to become loggy, and means are provided for scavenging the various recesses of the carburetor of such jelly-like aggregations as would of course lend trouble were they allowed to remain.

The float feed type of carburetor is not alone in the field, since there are illustrations of the Krebs idea, and in certain classes of work, notably in connection with the two-cycle motors, injectors are making headway, promising overmuch.

It may be well to call attention to the growing use of the hot water idea of eliminating the refrigerating effect due to the evaporation of gasoline; it works well.

Spark Plugs in Profusion.—Spark plugs were improved in so many ways in recent times that it is a little difficult to specifically enumerate any considerable number of them. Auto-ists will be interested to know that the grade of porcelain is now up to a standard such as will practically exclude the annoying

ignition failures, once the bane of the spark plug. The packing around the insulation, which may be of porcelain on the one hand and mica on the other, will not be the cause of cylinder leakage in the well-made spark plugs now to be had.

The A. L. A. M. standard thread for spark plugs is now quite extensively adopted, and from appearances it would seem as if the matter will simmer down to one standard thread for all spark plugs, insofar as American cars are concerned. While standards, speaking generally, are difficult to establish, the fact remains it is an important matter when reference is had to spark plugs; an autoist would be able to replace a defective spark plug from the stock of any supply house, however remote from the marts of trade, which facility can only be brought about if a standard thread is adopted.

The Utility of Mufflers.—In the earlier examples of mufflers, if the noise was dampened, so was the power. It required a good deal of effort and some ingenuity to eliminate the noise of exhaust without suppressing the power of the motor. Modern mufflers accomplish this, and they are provided with muffler cutouts, mostly to make a noise.

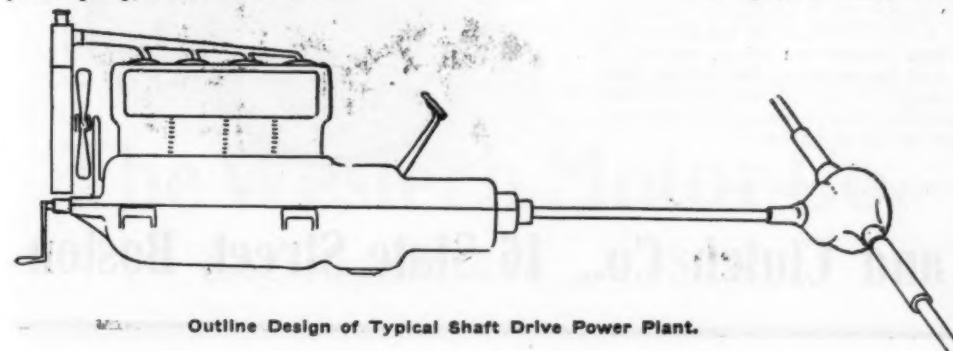
The Cooling Systems.—During the cut and try period it was the system of water cooling that had full sway. Air cooling seems to have been retarded somewhat, possibly because it is a more difficult engineering feat, or, better yet, due to the absence of reliable data on the subject. The splendid service rendered by air-cooled motors, despite the obvious difficulties that beset the earlier designers, has resulted in an astonishing growth of this branch of the industry, contrary to forecasts on the part of those who failed to observe sufficiently close. That the air-cooled situation is on a healthy basis is so well known as not to require comment.

Referring to the air cooling situation, there are two dominant ideas, the one of which involves a direct air blast, while the other affords a greater volume of air over a greater surface, under conditions not so pronounced in point of air pressure. There are differences in details of design of the cylinders, valves and other details, when reference is had to the air cooling method.

Water Circulation.—In this connection there are two fundamental ideas, the one of which takes into account the "thermo-syphon" system of water circulation, while the other involves forced circulation by means of a pump. In the thermo-syphon system the circulation is natural, due to the difference in weight of hot and cold water. The cooler should be somewhat larger if the thermo-syphon system is used, and the propeller blades of the air fan should be most carefully proportioned. That these matters have been taken care of is proven by the fact that the thermo-syphon system is backed up by a horde of enthusiastic autoists, who lay stress upon the absence of the water pump; and such complication as its presence would naturally dictate.

By way of coolers (radiators) there are splendid examples of the respective generic types to be seen at every hand. The cooling ability has been reduced to a fine art, and the weight factor is approximately two-thirds of what it was a year ago. The stability of coolers has been accentuated, and, on the whole, this phase of the situation is truly up to date.

Water pumps are much improved, and among them will be found the centrifugal type, the paddle wheel modification thereof, the gear pump, and of late something by way of an oscillating paddle pump, said to be efficient.



Outline Design of Typical Shaft Drive Power Plant.

Clutch and Flywheel.—These members, while they perform separate functions, are usually in conjunction with each other. The flywheel absorbs the surplus energy and gives it back again when the motor is least capable of delivering power. In this year's products ample provision is made in this respect. The clutch problem, on the other hand, is one involving the control of the speed of the car, with the motor running continuously. This problem is met in diverse ways, prominent among which are (a) multiple disc clutches, (b) leather faced cone clutches, (c) the same with cork inserts, and (d) flat band clutches, with metal to metal. In some of the examples of disc clutches (submerged in oil) cork inserts are used, while in other examples the oil is dispensed with.

Transmission Gear Set.—The gears are of alloy steel in nearly every case; three speeds and reverse holds the center of the stage, and the selective system is very popular indeed. Direct on the high gear dominates the situation, and the entire absence of noise is a conspicuous feature in high gear. As a rule, the cars are light enough to stand for high gear on all but the most unworthy roads and on grades, with occasional exceptions, so that the fourth speed is not missed. Certain types of cars are provided with the fourth speed, and in such cases the direct drive may be on third or fourth speed, depending upon the dictates of the designers.

Propeller Shaft.—The shaft drive is most conspicuous, and in the light touring cars of moderate power it is almost to the exclusion of the chain drive. The propeller-shaft lines up almost for a straight-line drive, so that the universal joint is not required to transmit at any considerable angle. Radius rods are strong and work on very nearly true centers, so that "cramping" of the rotating parts is conspicuous for its absence.

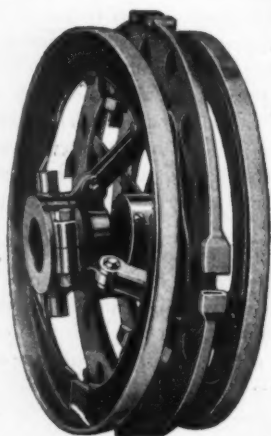
Jack Shaft.—The differential is on the jack shaft (as usual) and in the side-chain drives, within the gear set housing. In the shaft drive cars the live rear axle takes the place of the jack shaft, and the year's crop of live rear axles are excellent illustrations of the advances made. The floating type is well represented, but the greatest advances were by way of stiff trusses, in the examples of live rear axles using them, although it is worthy of note that the trusses are dispensed with in some cases, involving expanded tubes.

Provisions for Oiling.—This important subject was purposely withheld, since it relates to the whole power plant rather than to the motor alone. Forced feed lubrication is now common, whereas last year it was in isolated cases. A single "tell-tale" is frequently used, and the oil is fed to the vital parts of the motor, to the universal joints, the gear set and, in fact, to every place requiring liquid lubrication, in the best examples.

In place of a small hole, to receive mud all the time and a drop of oil occasionally, grease cups are used in some profusion, and the saving in repair accounts should be considerable in consequence. The hard lubricant is extended to the gear set and the universal joints. Indeed autoists are fast becoming acquainted with the virtues of grease as a lubricant, not to forget that graphite has its strong adherents as well. It is lubrication that saves repairs, and the makers of cars have put it up to users this year by ways adequately provided for the contingency.

Protection from Mud.—This phase of the question never did receive proper attention until very recently. In the present examples, it seems, an attempt was made to compensate for past neglect.

Perfect Ease of Control.—With the selective speed changing system, clutches free from spinning proclivities, splendid brakes, precision of timing, perfected carburetion, and a nice relation of the motor power to car weight for speed, the autoist is provided with every requisite essential to the control of the present type of cars, whether or no he counts among his accomplishments great skill in the process.



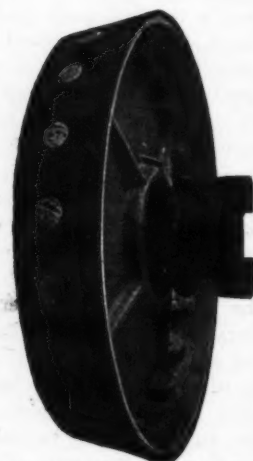
Three-Plate Disc Clutch with
Cork Inserts.
The Autocar Company.

466,800 H.P. is being transmitted by
clutches equipped with

CORK INSERTS

(Patented)

in cars made by these well known builders



Leather-Faced Cone with
Cork Inserts.
The Geo. N. Pierce Co.

Meteor Motor Car Co.
Adams Co.
Moline Automobile Co.
Pennsylvania Auto Motor Co.
Dayton Motor Car Co.
Stevens-Duryea Co.
Chadwick Eng. Works.
Overland Motor Co.
George N. Pierce Co.
E. R. Thomas Motor Car Co.
Nordyke & Marmon Co.
Selden Motor Vehicle Co.
Studebaker Automobile Co.
"Long-Arm" System Co.

Conover Motor Car Co.
Autocar Co.
Garford Co.
Pope Mfg. Co.
St. Louis Car Co.
Tiley-Pratt Co.
Olds Motor Works.
York Motor Car Co.
Acme Motor Car Co.
Mora Motor Car Co.
Atlas Motor Car Co.
Midland Motor Co.
H. E. Wilcox Motor Car Co.
Napier Motor Car Co.

Roberts Motor Car Co.
Mack Bros. Motor Car Co.
Imperial Motor Car Co.
Coppock Motor Car Co.
F. B. Stearns Co.
Matheson Motor Car Co.
Auto Parts Mfg. Co.
Abendroth & Root Mfg. Co.
American Machine Mfg. Co.
Forest City Motor Car Co.
Sternberg Mfg. Co.
Marion Motor Car Co.
Knox Automobile Co.

Chase Motor Truck Co.
Reliance Motor Truck Co.
Alden Sampson Mfg. Co.
Stilson Motor Car Co.
Kirkham Motor Mfg. Co.
Premier Motor Mfg. Co.
Continental Motor Mfg. Co.
Klink Motor Car Mfg. Co.
Northway Motor & Mfg. Co.
New York Car & Truck Co.
Cornish-Friedberg Motor Car Co.
Simplex Motor Car Co.
De Luxe Motor Car Co.

Oil - Cooled Cork Insert Brakes

Extracts from an editorial in *The Automobile*, Oct. 22, 1908, entitled "A Departure in Brake Practice":

"One of the last things that the average driver is anxious to have come in contact with the brakes of his car is oil, so that at first sight the proposal to employ brakes running in oil appears somewhat far-fetched, in view of the fact that even a small amount of lubricant is destructive of the frictional properties of two rubbing surfaces. This is true of metal, wood, or fiber surfaces, regardless of their character but it is one of the peculiar properties of Cork that its coefficient of friction with a metal surface is but very slightly influenced by the presence of oil in any quantity, and it is this that has made possible what may best be termed an OIL-COOLED BRAKE."

"The protecting influence of the oil, and the possibilities that it throws open in the way of improved brake service, as compared with the present-day practice of employing frictional materials that must, of necessity, be renewed periodically, are limitless. It would be futile to attempt to pit either the water or the air-cooled brake against one constantly immersed in oil, as in view of the peculiar property of Cork in not losing its frictional properties under the influence of a lubricant, the advantages of a generous supply of oil for cooling are obtained, without the attendant disadvantages of lubrication, which are naturally not to be desired where the object in view is the maximum friction."

In Perfect Condition After Run of 12,189.6 Miles on Premier Century Car

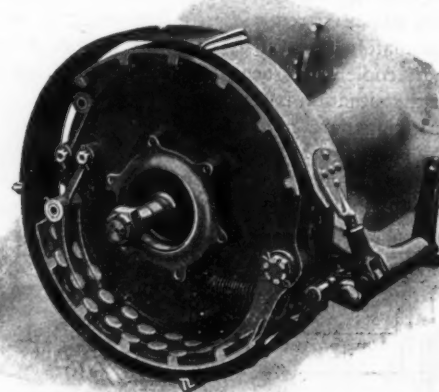
Extract from the Official Report of Messrs. Becroft and Nadall on the Premier Cork Insert Oil-Cooled Brake, after making a run of 12,189.6 miles:

"The external fiber-lined brakes did not appear to have been used, and were in perfect condition.

"The internal brakes, bronze expanders, 14 3/8 inches in diameter and 3 inches wide, provided with Cork Inserts did not show any indication of wear or scratching. These brakes run in oil, and all of the Cork Inserts were in condition, and the wear on the bronze shoe was not noticeable, except at the margin in two places, where there had been a little dragging. The committee was particularly impressed by the dimensions and observations of these brakes."

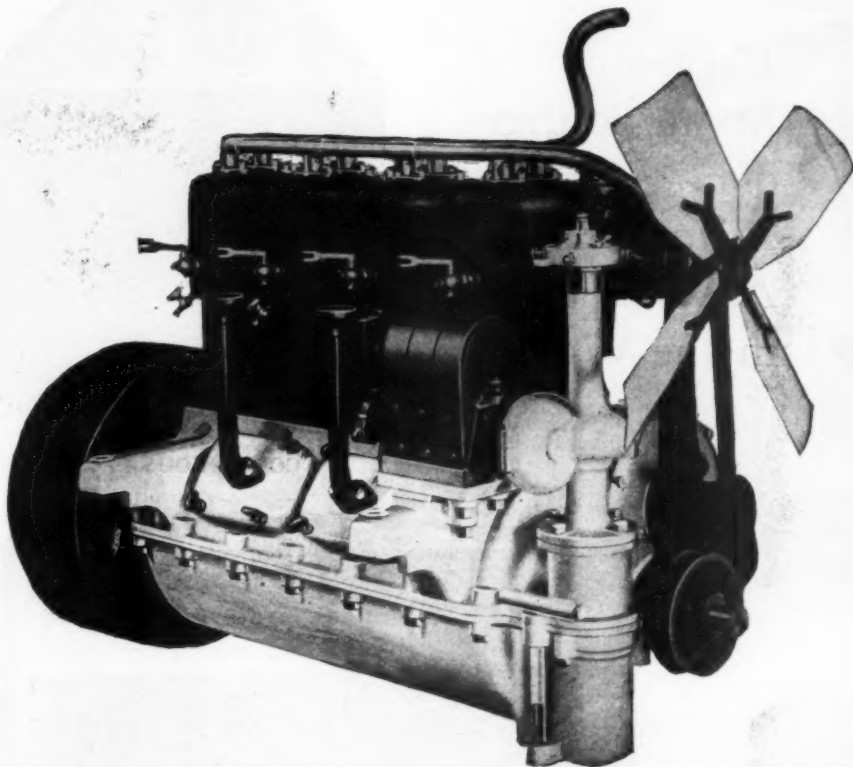
If you have Clutch or Brake troubles write the

National Brake and Clutch Co., 16 State Street, Boston



The RUTENBER

1909 Models



4 Cylinder, 4 x4, 25-28 h. p.
4 Cylinder, 4½x5, 30-35 h. p.
4 Cylinder, 4¾x5, 40-45 h. p.
6 Cylinder, 4½x5, 50 h. p.

FITTED WITH OIL-
PAN BASE AND
EQUIPPED FOR MAG-
NETO ATTACHMENT

Rutenber Motors were the first four-cylinder motors made and offered for sale in the United States, and met with immediate recognition and have held popular favor ever since and today are the standard multiple cylinder motors with an unprecedented demand, taxing the ability of an immense plant, one of the largest in the country, working night and day, to keep pace with orders. Rutenber Motors are unequalled for power developed, smoothness of running and general efficiency. Early arrangements should be made to secure Rutenber Motors in quantity for next season.

Cylinder Castings Our foundry capacity is such that we can handle large orders for cylinder castings promptly—finest castings, uniform, clean and true to pattern. We solicit correspondence from interested manufacturers.

Brass and Aluminum Castings

We make a specialty of all kinds of castings in Brass and Aluminum—producing in large quantities. We have unusual facilities in this line.

Write us for full information concerning Motors and Carburetors

The Western Motor Co.

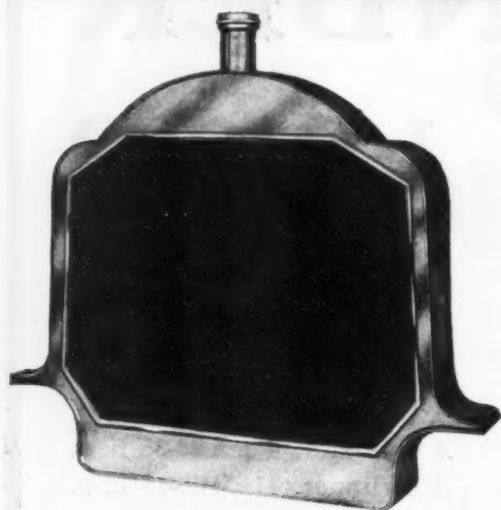
Logansport, Ind., U. S. A.

THE RUTENBER CARBURETER



Type A—Verticle Outlet

Briscoe Manufacturing Company



HONEYCOMB

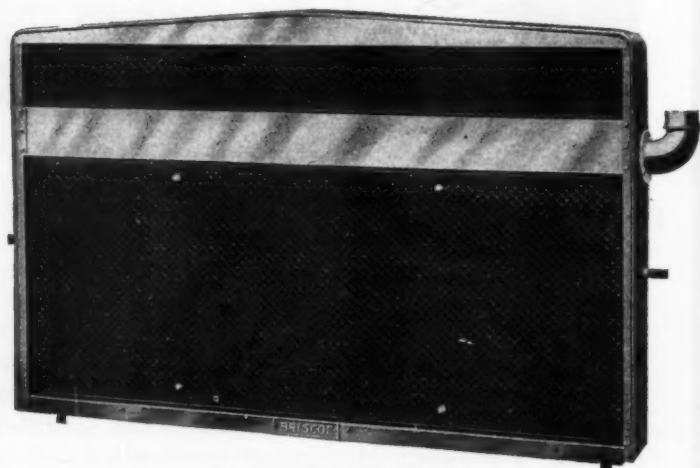
Largest
Manufacturers
of
Automobile
Accessories
in the World



VERTICAL TUBE
CONTINUOUS FIN

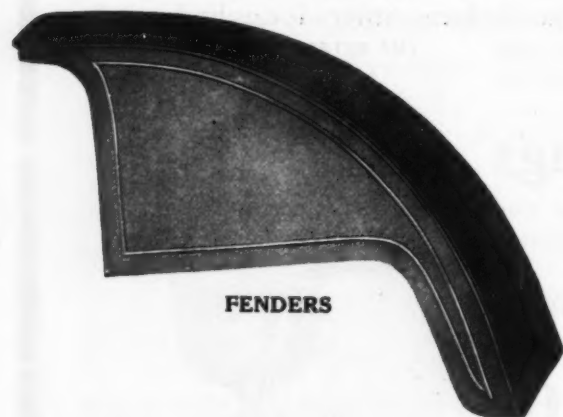


HORIZONTAL TUBE



HONEYCOMB TRUCK

Material and Workmanship
Guaranteed



FENDERS

We Repair
All Makes of
Radiators



HOODS

Detroit, Mich.

WRITE EITHER FACTORY FOR
CATALOGUE AND QUOTATIONS

Newark, N. J.

TAKE YOUR CHOICE

1909 Model "K" Motor

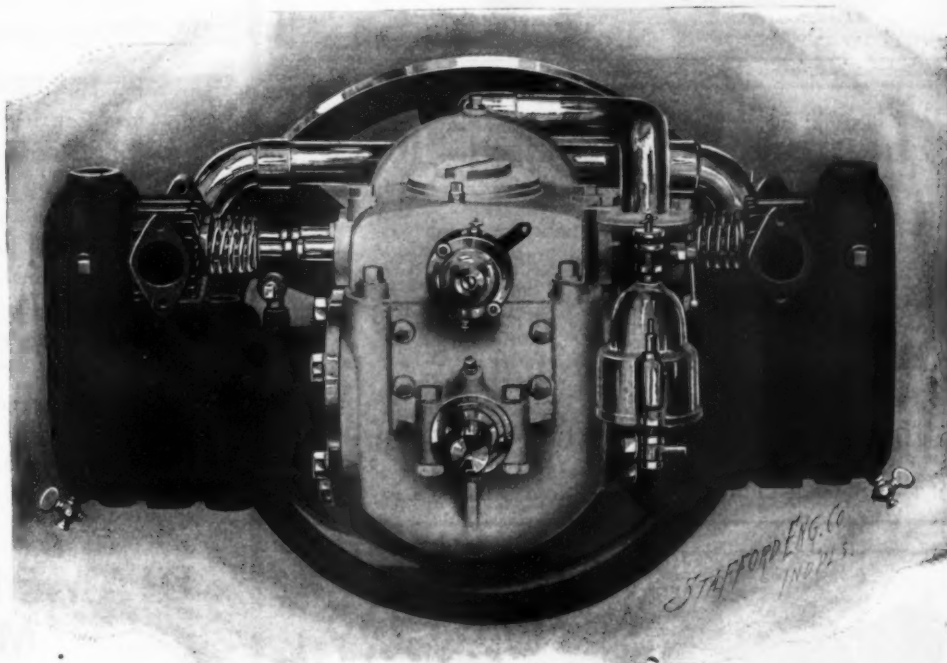
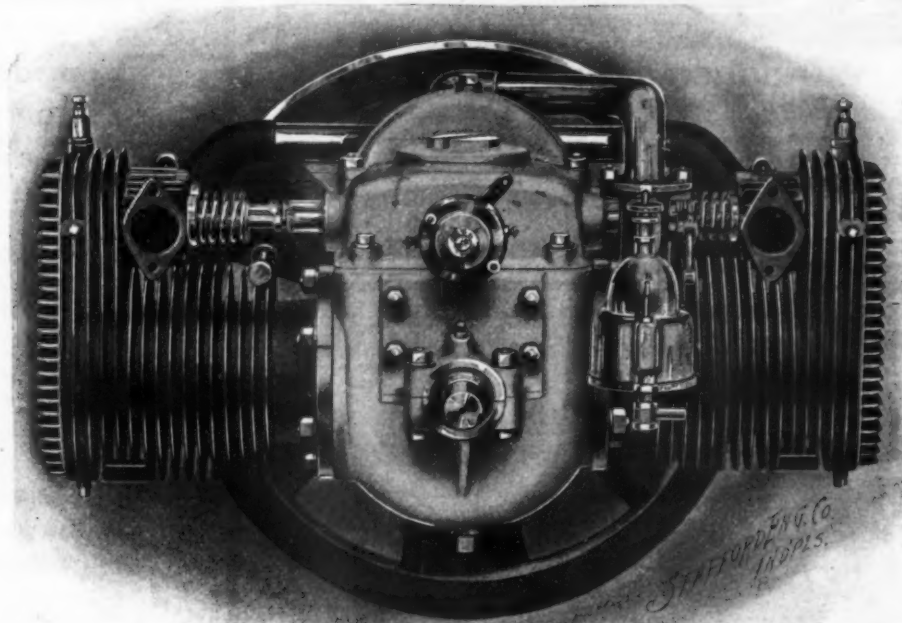
FOR HIGH WHEEL BUGGY
and LIGHT DELIVERY
WAGON

14 H.P. AIR COOLED.
16 H.P. WATER COOLED.

Off-set Cylinders.
Straight Connecting Rods.
Mechanically Operated Valves.
Perfectly Balanced.
Thoroughly High Grade.
Overall Dimensions, Length 27½"; Width,
15½"; Depth, including Fly wheel, 19½"

Prompt deliveries assured as
the capacity of our new
up-to-date plant is
12,000 Motors
per annum.

Send for Catalogue.



We are also manufacturers of the Original Carrico 4-Cylinder Air Cooled Motor, 20-24 H.P.
Send for Descriptive Pamphlet.

SPEED CHANGING PULLEY COMPANY

ANDERSON, INDIANA

Raybestos

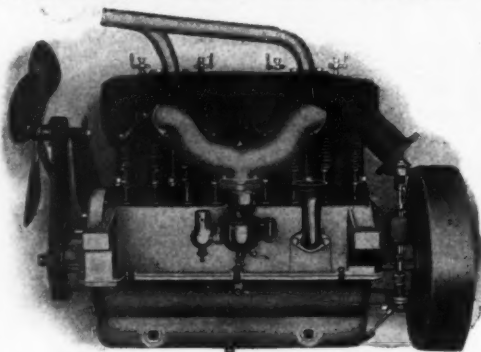
A FRICTION FACING FOR AUTOMOBILE BRAKES AND CLUTCHES

Raybestos is heat proof, oil proof, water proof, weather proof (almost) wear proof.

Raybestos is absolutely the only lining on the market creating friction greater than metal to metal and making sure a quick and easy stop on the steepest grade.

ROYAL EQUIPMENT CO. 155 Housatonic Ave., BRIDGEPORT, CONN.

Northway Motors are Powerful and Silent



They include integral oiling system, fan, timer, carburetor, magneto provision. In three sizes, 20-25-32 H. P.

Write for Bulletin.

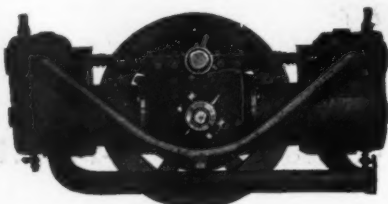
Northway Motor & Mfg. Co., Detroit, Mich.

"Long-Arm" Transmissions

Three speeds and reverse, selective types. The best of material and workmanship. Our experience in gear cutting and manufacturing Automobile Parts enables us to equal the best transmissions built. Let us figure on your requirements. We also build a complete line of Axles, Clutches, Steering Reaches, Hand Levers, etc.

The "Long-Arm" System Co., Cleveland, O.

Sales Department:
The American Distributing Co., American Trust Bldg., Cleveland, O.



BEILFUSS

DOUBLE-
OPPOSED
CYLINDER
AUTO
MOTORS

10-12 H. P. AIR COOLED.

10-12 and 18-20 WATER COOLED

No better two-cylinder engines made anywhere, and none made better. You want the best, don't you? Send for circulars and prices.

THE BEILFUSS MOTOR CO.

LANSING, MICH., U. S. A.

FACTS ABOUT CHAIN DRIVES

Consider these facts when you compare chain and gear drives

- 1 Over 90 per cent. of European cars are chain driven. More chain driven cars were exhibited at the last Paris show than ever.
- 2 More American cars were built with Chain drives in 1908 than ever before. The 1909 production promises to double that of 1908.
- 3 Practically all cars in the Vanderbilt Cup Race were chain driven. The few shaft driven cars made no showing worthy of mention.
- 4 Chain is simpler, costs less, is more flexible, runs smoother, is easier repaired, easier on the tires, and permits an inexpensive and quick change of gear ratio.
- 5 By ROLLING instead of GRINDING into mesh, chains do away with that wearing friction which is so destructive and so detrimental to speed.
- 6 Diamond Chains have been so improved in material and process of manufacture in the last few years, that they are practically proof against serious elongation. With this feature of wear eliminated, the greatest objection to chain drives is removed.

If you want to know more about Diamond Chain Drives, write for our Booklet.

DIAMOND CHAIN & MFG. CO.

230 W. Georgia St., Indianapolis, Ind.

Capacity 8,000,000 ft. per year



BRENNAN MOTORS

We furnish motors and transmissions complete for all standard makes of cars, such as Aerocar, Olds, Pope-Hartford, Ford, Cadillac, Jackson, Wayne, etc., whether horizontal opposed or vertical. Here are some of them: 2-cylinder, horizontal opposed, 5x5 annular ball bearings; 2-cylinder, horizontal opposed, 5 1-2x5 annular ball bearings; 4-cylinder, vertical, 4 9-16x4; 4-cylinder, vertical, 5x5; 4-cylinder, 5 1-2x6; 4-cylinder, 6x6. All of the above supplied complete with transmission on sub-frame or pressed steel frame, also to order, four and six-cylinder chassis complete, ranging from 28 to 80 H. P. Write for information.

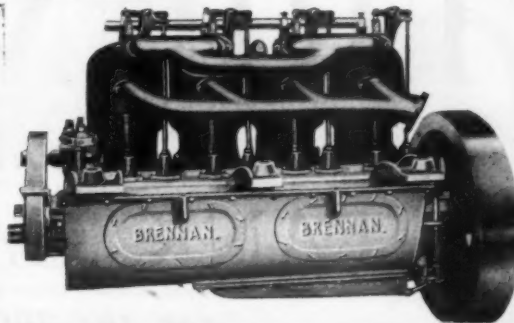
Let us figure with you on a new engine and transmission for your car.

Write to-day, giving conditions, and we will gladly submit estimates.

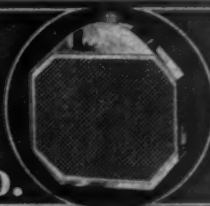
BRENNAN MOTOR COMPANY, Syracuse, N. Y.

We will exhibit at the Ninth National Automobile Show, to be held in Madison Square Garden, New York City, Jan. 16th-23d, space 160.

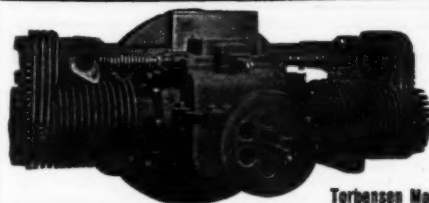
Motors which can be relied on at all times to give the fullest satisfaction. The name of "BRENNAN" has been a guarantee for years of highest quality and skilled workmanship.



WHITLOCK
INTAKE, EXHAUST
Whitlock Coil Pipe Co.



RADIATORS
AND WATER PIPES
Hartford, Conn.



THE TORBENSEN

2-cylinder opposed air-cooled motor, built in two sizes, 12 and 18 H.P. for all purposes requiring continuous, reliable and satisfactory service.

Torbensen Motor Car Co., Bloomfield, N. J.

Construction of a Gasoline Motor Vehicle

By C. C. BRAMWELL. Contains 150 pages, 6 x 9; one hundred illustrations and diagrams. Publisher's price, \$2.00; our price, 50 cents. Address, The Automobile, 231-241 West 39th Street, New York.

SPECIFY "HARTFORD" UNIVERSAL JOINTS



Type J Universal Joint. Dis-assembled.

You will get something that is as good as you could wish for, and at a surprisingly low price considering the quality of material and machine work. There is no secret about it, simply due to the fact that they are

MADE BY . . SPECIALISTS

All of our machinery and tool equipment has been specially designed for this work. We manufacture in large quantities and buy raw material in car lots. That's why a few manufacturers

who formerly made their own joints now find it profitable to have us make them. Our prices and examination of our samples would be a pleasant surprise to you. "Hartford" Universal Joints have come to stay because they are made right and of the best material to be had. We believe there are plenty of manufacturers who

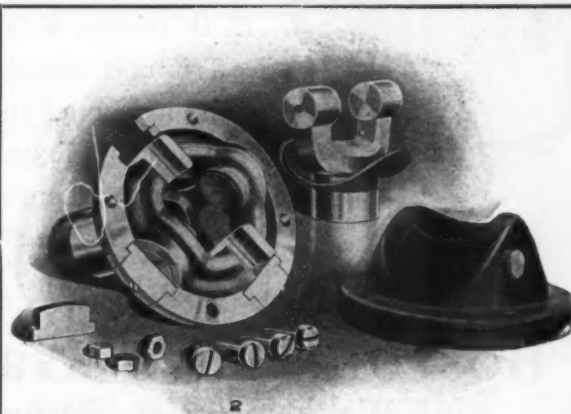
appreciate "good stuff" and are willing to pay a fair price for it. For the season of '09 we are making a large number of our Type J Joint, furnishing them as a complete drive—shaft with joint on each end. The Type C, as shown, is the latest thing on the market and the price is surprisingly low. No castings in it, all drop forgings. Better get in touch with us. It will cost only a red stamp to find out what we can do for you.

THE HARTFORD AUTO PARTS CO.

441 Asylum Street, Hartford, Conn.

J. S. BRETZ CO., Times Bldg., N. Y.,

Selling Agents



Type C Universal Joint. Dis-assembled.

TRIUMPH

Gasoline TANK GAGES

for the 1909

WHITE STEAM CARS

Now Ready For Immediate Delivery.
Applied to Either Dash or Tank.

WRITE DIRECT TO COMPANY'S FACTORY.



TANKOSCOPE.

Thousands now in use on all leading cars and we have yet to hear of a complaint.

3,025 now in use on Pierce Great Arrow.

1,780 now in use on White Steam Cars.

Used as standard equipment on the Austin, Marmon, Ross Steam Cars, Matheson, American, La France, Shawmut, Speedwell and others.

Triumph Gages are also used exclusively by the leading manufacturers of Gasoline Tanks, S. F. Bowser Co., Janney, Steinmetz & Co., and E. B. Badger & Sons.

Triumph Gages are now recognized as part of the tank equipment and not as a luxury or accessory.

Specify when ordering your '09 car. No charge should be made for Triumph Gages.

Boston Auto Gage Co.

10 Waltham Street, Boston, Mass.

We made the first magnetic gasoline tank gage manufactured in the world in 1903.

QURIDE

(REGISTERED)

FILLED GEARS
ARE SILENT RUNNING

Let us tell you more about "QURIDE"
Picrome Hide Co., Syracuse, N. Y.



F. W. OFELDT & SONS

Nyaack-on-the-Hudson, N. Y.

MANUFACTURERS OF

Blue Flame Kerosene Burner
Safety Water Tube Boiler
Automatic Water Regulator
Automatic Fuel Regulator
Feed Water Heater
Compound Steam Engines

Our Kerosene Burner works to perfection on White Steamers

THE MORE YOU THINK OF IT
THE MORE YOU THINK OF IT

THERMOID BRAKE LINING

Trenton Rubber Mfg. Co., Trenton, N. J.

BEAVER MOTORS



6 cylinder, vertical, 40-45 H.P.

4 cylinder, vertical, 28-30 and 35-40 H.P.

2 cylinder, horizontal opposed 10-12, 14-16 and 18-20 H.P.

4 cylinder, horizontal opposed (special for commercial trucks) 35-40 H.P.

Center Crank Oiling Device.—4-cyls. Free Booklet.

Beaver Manufacturing Company
143 Burrell Street, MILWAUKEE, WIS.

AUTOMOBILE RECORD

By SIGMUND KRAUSZ

EXPENSE account for fifty-two weeks, with columns for cost of gasoline, carbide, kerosene, repairs, replacement, daily runs, chauffeur's salary, garage expenses, speed record, starting point, destination, motoring laws of thirty-five States and names of others having no laws. Totals expenses and runs for any period shown at a glance.

MOROCCO COVER, ONE DOLLAR

The CLASS JOURNAL COMPANY
231-241 West 39th Street, New York

A. B. C. OF MOTORING

By SIGMUND KRAUSZ

A MANUAL of practical information for layman, auto novice and motorist, containing dictionary of terms, types of cars, anatomy of the automobile, motors, carburetor, ignition, cooling, tires, transmission, etc. Care of the machine, art of driving, troubles of the road, etiquette of automobilism, racing rules and statistics, foreign travel, clubs, manufacturers, trade papers, speed tables, and complete digest of motoring laws of thirty-five States and names of those having no laws.

Morocco Cover : : : : Two Dollars

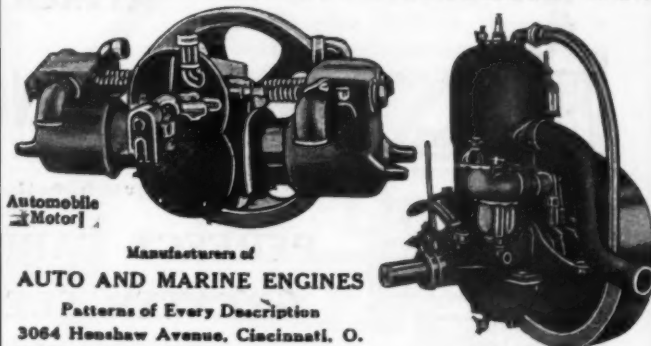
The CLASS JOURNAL COMPANY
231-241 W. 39th Street, New York

LISTS

of all Automobile Dealers, Garages, Charging Stations, Repair Shops, Dealers and Jobbers of Supplies, Purchasing Agents, Mechanical Engineers, etc. Write for our proposition.

The AUTOMOBILE TRADE DIRECTORY 231-241 W. 39th St. New York

SCHAUB & SON MACHINE CO.



Automobile Motor

Marine Motor

Manufacturers of
AUTO AND MARINE ENGINES
Patterns of Every Description
3064 Henshaw Avenue, Cincinnati, O.
Telephone, Park 296-L

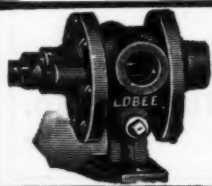
HERSCHELL-SPILLMAN MOTORS

AUTOMOBILE and MARINE

16-18; 24-30; Vertical Four and
45-55 H. P. Six Cylinder Types

HERSCHELL-SPILLMAN CO.

North Tonawanda, N. Y.



If you want good circulation on your automobile, launch or motor boat, use a

LOBEE PUMP

LOBEE PUMP AND MACHINERY CO.
120 Terrace Buffalo N. Y.

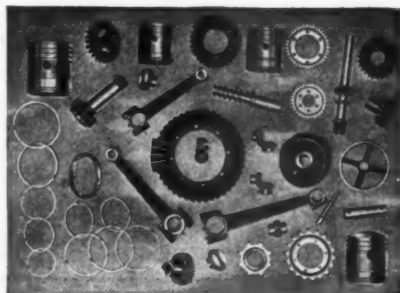
"Kinwood Radiators"

Force Feed Oilers, Pressed Steel Dashcs, Pressed Steel Frames, Hoods, Mufflers, Fenders, Step Molding

KINSEY MFG. CO.

No. 1126 E. 3d St., DAYTON, OHIO

AUTOMOBILE PARTS



We make **AUTOMOBILE** and **MOTOR MACHINE PARTS** like these shown in cut **BETTER** and **CHEAPER** than others and give **PROMPT** deliveries because we have the facilities to turn out the work **RIGHT**.

SPECIAL: Cams and complete Cam Shafts, Transmission Square Driving Shafts (all ground to di-

mension) made by special equipment of our own design.

GENERATED GEARS

OF EVERY DESCRIPTION

FINISHED DIE-CAST BEARING BUSHINGS Made on Specification

Let us submit estimates based on your specifications and blue prints.



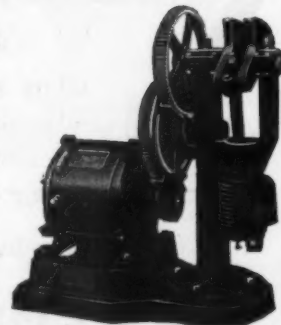
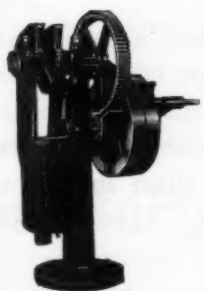
AIR COMPRESSORS

Belted—Motor Driven

Single and Three Cylinder Styles. Air or Water Cooled.

All modern garages use them for inflating tires, cleaning cushions, etc.

A compressor designed for hard and continuous service.



THE F. W. SPACKE MACHINE CO.
INDIANAPOLIS, IND., U.S.A.

TO KNOW

What To Do
And How
To Do It



When your gasoline motor or gas engine gets stubborn, can be quickly learned by owning a copy of the

Practical Gas Engineer

A Book of 172 Pages Neatly Bound in Cloth

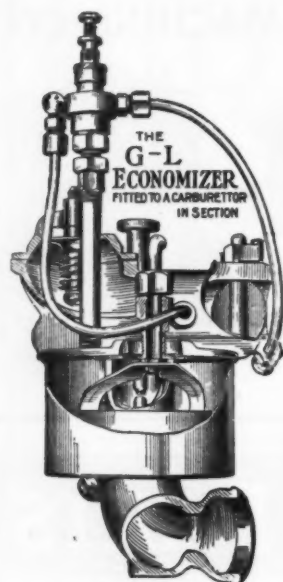
By E. W. LONGNECKER. Twelve years' constant experience with Hydro-Carbon Engines.

SIXTH EDITION JUST OUT and selling rapidly. First and Second Editions exhausted in thirteen months.

Special Chapter on Automobile and Motor Boat Engines.

Sent Postpaid on Receipt of Price, \$1

Book Dept., **THE AUTOMOBILE**
231-241 West 39th St., New York.



PRICE \$5.00

WRITE FOR OUR NEW 42-PAGE CATALOG

G-L ECONOMIZER CO.

1412 TIMES BUILDING

NEW YORK

ATTACH A

G-L ECONOMIZER

to your carburettor and get

PERFECT CARBURATION

GREATER FLEXIBILITY

and

25 PER CENT. SAVING OF GASOLINE

**We guarantee to prove it or
return your money.**

The Metropolitan Automobile Guide

Covering the territory within a radius of 75 to 100 miles of New York City and Vicinity with completeness and accuracy never before approximated.

**74 Complete Routes—
Every route a round trip**

6737½ Miles 382 Pages

Accompanied by City Diagrams and Route Maps, together with best accommodations in Hotels and Garages. Exact mileage given for every town and every turn and landmark on the routes.

Fully Illustrated and Described by text

The Plan and Purpose

The Metropolitan Guide is a Special volume devoted to the territory practically within a hundred miles of New York City, though a few of the routes extend in a longer radius. It is meant for the Autoist who wishes complete touring schedules from and back to New York City in sufficient variety to cover any section of the country in any way, the State lines practically ignored.

Bound in Genuine Leather, Price
\$2.50 Prepaid

The Class Journal Co.

231-241 W. 39th St., New York City

CONTINENTAL MOTORS

are manufactured in three sizes—Model "K," 24-28 H. P.; Model "G," 38-42 H. P.; Model "HB," 44-48 H. P. We, therefore, can meet your motor requirements, whether they be for taxicabs or light runabouts, heavy touring cars or commercial vehicles. These motors are manufactured in the largest and most completely equipped plant in the country devoted exclusively to the manufacture of Gasoline Automobile Motors.

Our designers and engineers have given special attention to the self-contained oiling system, extremely long bearings, offset cylinders, separate water jacket heads, adaptability for mounting magneto, etc., and the result is that our motors are very efficient, compact, light weight and durable. We therefore justly claim that there is more motor value in a "Continental" than in any other motor on the market.

Therefore, address your motor inquiries to the

CONTINENTAL MOTOR MFG. CO.

MUSKEGON, MICHIGAN

K. FRANKLIN PETERSON, Western Representative, 166 E. Lake St., Chicago, Ill.

THOS. J. WETZEL, Eastern Representative, 29 W. 42d St., New York City

Automobile Catechism

For the Use of Owners and Drivers
of Cars Fitted with Internal
Combustion Motors

BY

FORREST R. JONES, M. E.

Principal of the Manhattan Automobile School

AN indispensable companion for all who own or drive automobiles. It is written in simple language and in question and answer form, so that by the aid of a complete cross index the autoist can get immediate help in time of trouble. Where necessary, diagrams will illustrate the text.

The AUTOMOBILE CATECHISM is pocket size and bound in real Morocco leather, which will wear indefinitely. Price, \$2.00, postpaid.

THE CLASS JOURNAL COMPANY

231-241 WEST 39th STREET
NEW YORK CITY



Are you a Doubting Thomas?
Don't you believe there is a
better Carbureter than you
now use, no matter how good
it may be?

We can prove that

"The Duplex"

is superior to any Carbureter
you ever saw or used

Write to Us To-day

An inquiry carries no obligation but will supply you with Facts which, if acted upon, will eliminate all carbureter troubles and make the running of your car better and more economical.

"The Duplex" is adapted to any engine

Constructed on scientific principles incorporating extreme simplicity and highest efficiency.

No springs; no auxiliary valve; no flooding; no leakage; no power restriction; no priming.

Only one adjustment; one throttle; perfect control.

A Carbureter that will make your car run better, with more power and greater economy. **TRY IT.**

THE DUPLEX COMPANY

BELFAST, MAINE

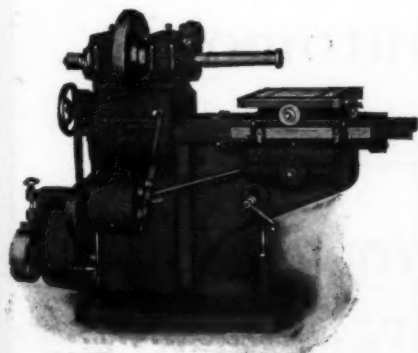
Designers, Pattern Makers, Iron, Brass and Bronze Founders, Machinists, and BUILDERS of
HIGH SPEED MOTOR BOATS.

DEALERS! Write for our Special Discounts

A BIG STEP FORWARD

is made when you adopt

HEALD GRINDERS



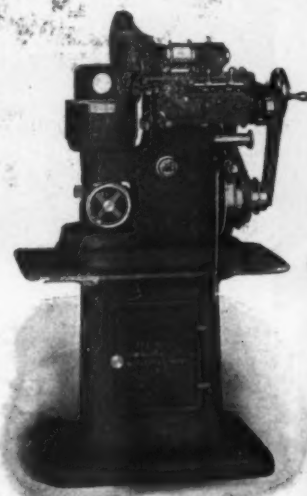
The Heald Cylinder Grinder

solves the whole problem of finishing your cylinders.
No more expense for reamers or for keeping reamers sharp.

No cylinders oversize when reamers are sharp and undersize when reamers are dull.

No matter whether the iron is hard or soft, it's all the same.

The only satisfactory and successful machine and method on the market to-day.



The Heald Ring and Surface Grinder

This is the standard machine for finishing Piston Rings to accurate thickness to properly fit the Piston.

Also valuable for Discs, Dies, Thrust Collars, etc.

Send for special catalogs. Made in Six Styles.

THE HEALD MACHINE CO., 16 New Bond St.,
WORCESTER, MASS.

ESSENTIAL FEATURES of CRANK SHAFTS



In addition to correctness of design, quality of material and accuracy of finish are essential features. If you are having crank shaft troubles, it is probably on account of defective or unsuitable material, or imperfect finish, or both. It is as important that they be properly made, and from good material, as it is necessary to prepare the design and dimensions. If you will furnish the specifications, we will undertake the rest. We make them to order only, finished ready for use. We want your orders and can convince you that we merit them.

SEND COMPLETE SPECIFICATIONS FOR PRICES

STANDARD CONNECTING ROD CO.

Beaver Falls, Pa.

Self-Propelled —Vehicles—

IT'S a new book by J. E. Homans, A. M.; tells the whole story. It explains in simple, non-technical language the mechanism and management of every type of automobile. 640 pages; 500 illustrations; complete diagrams; ready reference index. \$2.00

ADDRESS

Book Dept., CLASS JOURNAL CO.
231-241 West 39th Street, New York

AUTOMOBILE CATECHISM

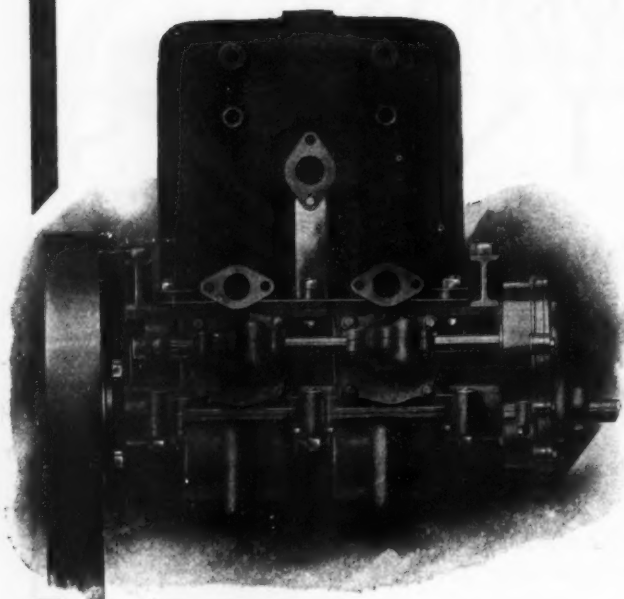
For the Use of Owners and Drivers of Cars Fitted with Internal Combustion Motors

By FORREST R. JONES, M.E.
President of the Manhattan Automobile School

THIS is the most practical, up-to-date work on the subject in the English language. It is published in pocketbook form, with high-grade leather cover, and printed on especially tough paper, as it is intended to be the inseparable companion of the autoist when on tour. Size, 4½x7 inches. Pages 134. With Drawings.

PRICE, IN GENUINE MOROCCO COVER, GILT EDGES, \$2.00, INCLUDING POSTAGE

The CLASS JOURNAL COMPANY
231-241 West 39th Street, New York



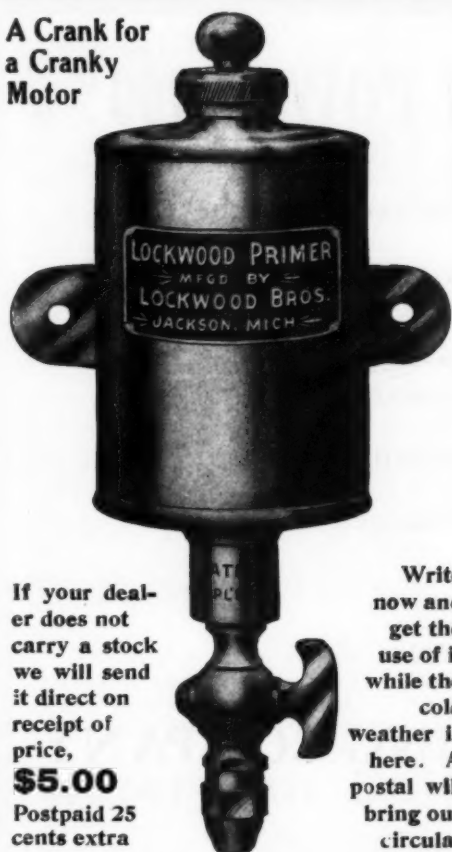
THE only flexible,
two-cycle motors
manufactured expressly
for the automobile.

*To be exhibited at Grand
Palace Show, Space 442*

WILLET ENGINE & CARBURETER CO.

764 Ellicott Square, BUFFALO, N. Y.

A Crank for
a Cranky
Motor



If your dealer does not carry a stock we will send it direct on receipt of price, **\$5.00** Postpaid 25 cents extra

Write now and get the use of it while the cold weather is here. A postal will bring our circular

The Lockwood Primer

When you start your car in the morning, do you crank your head off?

The man who is tired of needless work on the dangerous end of an automobile is the man we want to talk to.

If you were sure you could start your motor so easily that it would be a positive pleasure, you wouldn't hesitate in having a primer put on.

We will guarantee to satisfy you, and will give you 30 days to try it. If it doesn't come up to your expectations, return it, and we will refund your money.

Now, Mr. Man, this is not "Bunk." We know it will work to your entire satisfaction on your car.

If for any reason you do not want it, all you have to do is return it inside of 30 days and you will get your money by return mail.

LOCKWOOD BROS., 103 Pearl Street, Jackson, Mich.

THE BOWERS CARBURETOR

MODEL "G"

A LIGHT, compact carburetor of the Venturi type, designed for use on Automobile, Marine or Stationary engines. It will make engine easy to start, will show good power and speed, smooth running and quick acceleration. It is very simple in construction, having but one adjustment, and is of the highest grade of manufacture. We are willing to submit carburetor subject to inspection and trial and will guarantee its action to be absolutely satisfactory.

We furnish our Model "G" Carburetor in 1 inch, 1½ inch and 1¾ inch sizes, with either vertical or horizontal outlet and flange connection. We are in position to make prompt deliveries in any quantities. Special prices to manufacturers.

PRICE, complete, 1 inch and 1½ inch sizes . . . \$10.00
1¾ inch size 12.00

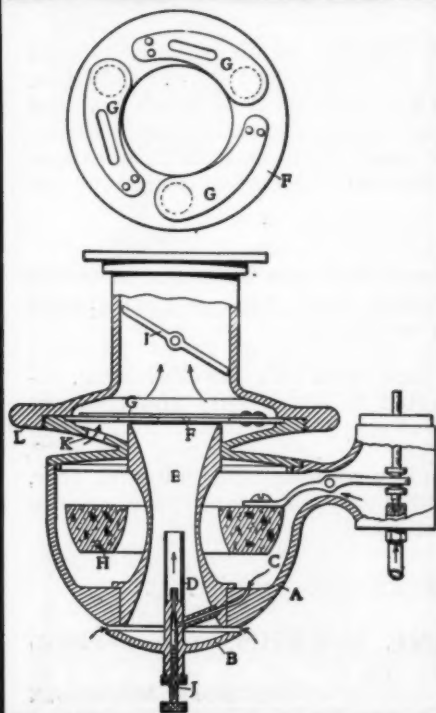
AGENCIES:

Boston, Percy Ford Co.; The Bi-Motor Equipment Co.; Philadelphia, The Geo. W. Nock Co.; Charles S. Smith & Co.; Albany, The Albany Iron & Hardware Co.; St. Louis, Behen-Faught Co.; Buffalo, Brunn's Carriage Manufactory; Detroit, Auto Equipment Co.; Chicago, Eugene Arnstein; St. Paul, C. J. Smith Co.; Portland, Ore., Ballou & Wright; Portland, Me., The James Bailey Co.; San Francisco, Hughson & Merton; Los Angeles, Hughson & Merton; Pittsburg, Kaufmann Brothers; Providence, Waite Auto Supply Co.; Springfield, The E. R. Clark Auto Co.; Chicago, Motor Car Supply Co., The Standard Auto Co.

THE F. E. BOWERS COMPANY,

NEW HAVEN, CONN.

New York Office, 1601 Broadway - A. H. GREEN, Mgr.
Chicago Office, 1436 Michigan Ave. - F. E. SPARKS, Mgr.
Eastern Sales Representatives, WHITE & VON WETTERBERG, Hartford, Conn.



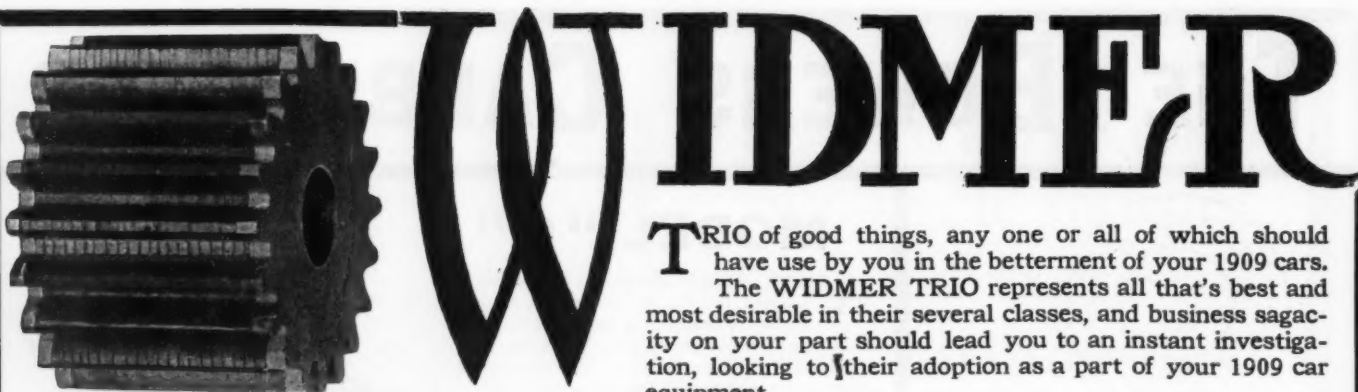
100% MINIMUM INCREASE IN POWER 100%

is applied individually to the driving wheels by the use of the HEDGELAND EQUALIZER, over what can be applied by the use of the differential. We drive both wheels positively. This helps on bad roads. Of vital interest to commercial car builders, standard equipment on several of the '09 leading cars. Interchanges with differential on twenty-two makes of cars.

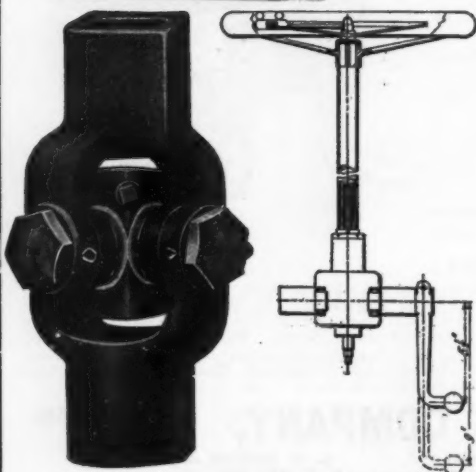
Write for the list

HEDGELAND MANUFACTURING COMPANY

CANTON, OHIO.



TRIO of good things, any one or all of which should have use by you in the betterment of your 1909 cars. The WIDMER TRIO represents all that's best and most desirable in their several classes, and business sagacity on your part should lead you to an instant investigation, looking to their adoption as a part of your 1909 car equipment.



Patent applied for

Patent applied for

Non-Swell Gears

The filled gears that can be run in oil or out of oil, that retain their shape and are always noiseless in operation.

Universal Joints

Absolutely dust-proof and self-lubricating, especially adapted to heavy duty and constant tortional service.

Little Giant and Buggyabout Steering Gear

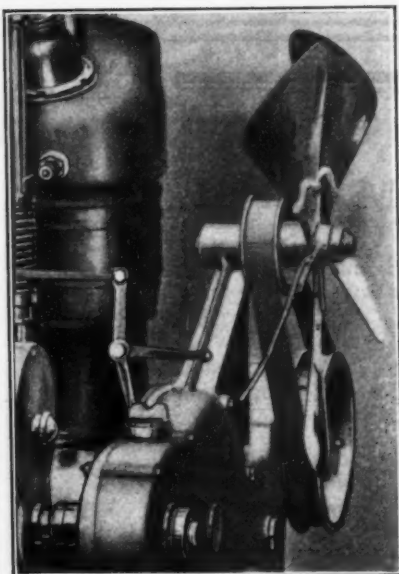
An exceptionally compact and powerful gear, made to withstand abuse and hard service and not cost much.

WRITE FOR FULL PARTICULARS AND PRICES

C. A. WIDMER MACHINE WORKS, (Incorporated)

45-47-49 Fort Street East

DETROIT, MICHIGAN



A.S.O. FAN BELTS FOR AUTOMOBILES

**"The
Perfect
Belt"**

No slip, positive in action; heat, oil and waterproof; made in all sizes, both flat and V shape; thousands now in use on Packard and other high-grade cars.

You take no chances, we guarantee the A. S. O. belts to give perfect satisfaction. Clutch troubles are eliminated by using our chrome tanned leather which we guarantee will not slip and is impervious to water or oil conditions. A. O. S. leather is used by the leading makers of American Cars.

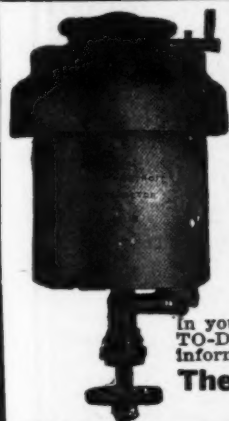


The A. S. O. Transmission belt for motor cycles

makes the cleanest smooth running transmission to be had; it will hold, it won't stretch out and need continual tightening. It is proof against trouble from water or oil; is long lasting and not costly in the first instance. May we send particulars?

American Belting and Tanning Co.

133 OLIVER STREET, BOSTON, MASS.



The Carburetor that Eliminates Trouble

It is designed with this one object in view—to overcome the objections found in other carburetors—AND IT DOES IT. It excels all others in every point of comparison—it is the perfection of carburetors—and you automobile owners and manufacturers who want the BEST must inevitably adopt

The WATT-DETROIT

BALANCED FLOAT CARBURETOR

It is a new principle and design and "makes good" under every test—regardless of speed and atmospheric conditions. In your own interests investigate this. WRITE TO-DAY. We will cheerfully furnish full detail information.

The Watt-Detroit Carburetor Co.
60 Griswold St., Detroit, Mich.

INSIST UPON A RADIATOR EASILY REPAIRED



LONG'S RADIATORS

are the only ones on the market that can be repaired when an accident is met with. Any broken tubes can be replaced with new ones at a small expense. Other makes of radiators when damaged must be entirely replaced at a heavy expense.

Send for Catalogue.

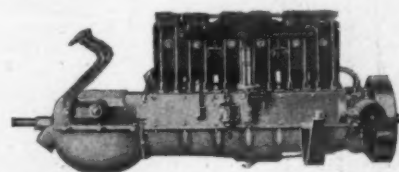
LONG MANUFACTURING CO., Chicago, Ill.

NEARLY EVERYONE KNOWS

that

BROWNELL MOTORS

for 1909 are Eminently Superior in design, construction, power, economy and in perfection of details.



Power Unit 6-Cylinder, Model A, 20-25
H. P. Automobile Motor

This complete power unit (in both 4 and 6-cylinders) is unqualifiedly the most desirable proposition on the market, for the Automobile Manufacturer or Assembler.

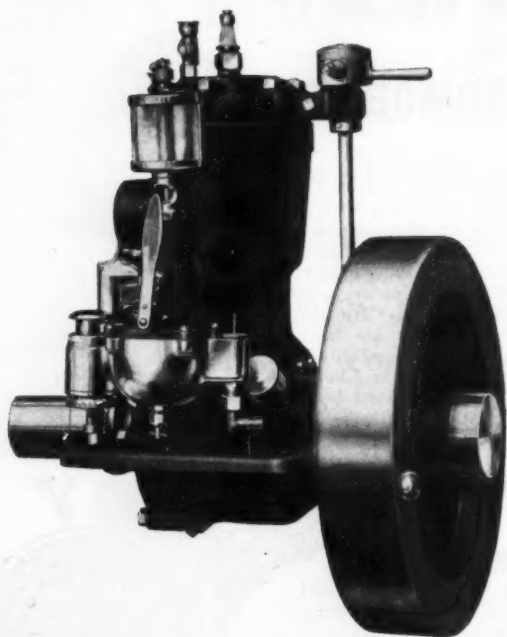
Hence It's Great Popularity.

Our line embraces Motors for a great variety of purposes. In 4, 6 and 8-cylinders, from 14 to 150 H. P.

A Postal—A Catalogue.

F. A. BROWNELL MOTOR CO.

ROCHESTER, N. Y.




HANDSOME CATALOGUE
DESCRIBING THE 1909 LINE OF
**FERRO MARINE
MOTORS**

Sent free to those who contemplate buying
an Engine or a Power Boat. Write for it.

1909 FERRO MOTORS
in 10 sizes, from 3 to 25 HP. are ready
for delivery. Ask for our information
sheet—it will help you select a motor best
suited for your purpose.

5000 FERRO SPECIALS
The best 3 HP. Motor that money can
build. **SOLD AT A LOW PRICE**
because of the quantity. Described in
our Catalogue.



THE FERRO MACHINE & FDRY CO.
806 SUPERIOR AVE. CLEVELAND O.
LARGEST MARINE ENGINE
BUILDERS IN THE WORLD

The Perfected KINGSTON Carburetor Floating Ball Type, Single Adjustment



Once adjusted, it is
right for all speeds

Absolutely automatic supplemental air supply inlets governed by 5 Ball Valves, all acting independently and opening or closing according to supply of gas demanded by motor.

Fully adjustable to any position. Economical—using only pro rata of gasoline according to power desired. Vertical or Horizontal Outlets adjustable to any position. This Carburetor eliminates objectionable features found in other types completely.

**No Springs
Noiseless**

SEE OUR EXHIBITS

New York: Dec. 31-Jan. 7,
Grand Central Palace,
Space 154

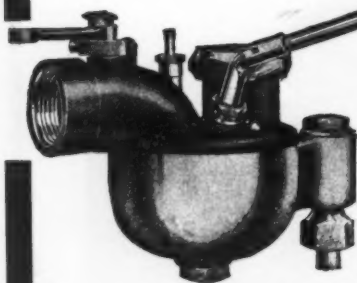
New York: Jan. 16-23, Madison Square Garden,
Space 157

Chicago: Feb. 6-13, Coliseum Gallery, Space 75

Byrne, Kingston & Co., Sole Manufacturers **Kokomo, Indiana**

THE DASHBOARD ADJUSTMENT OF THE Holley Model W Carbureter

An automatic carbureter is one that adapts the gasoline feed to the air velocity, so that the correct mixture is produced under all conditions of speed and throttle opening. Such a carbureter is the single-adjustment **Holley Model W**—the simplest automatic carbureter in the world.



But the best automatic carbureter cannot adapt itself to changes in gasoline density, or in humidity, or to the gradual warming up of an engine started from "cold." If you would have your motor tuned to concert pitch always, slight day-to-day adjustment of the carbureter is essential.

With the single adjustment **HOLLEY**, this delicate tuning for maximum power is done instantly—while the car is running—without guesswork or experiment. A rod connected by universal joint to the needle valve passes through the dash, and ends in a graduated, ratchet-held dial. You bring the car to road speed—or on a hill if you prefer—and turn the dial handle a little to right or left till the motor pulls strongest—and the trick is done.

There's no "maybe" or "perhaps"—no speculating as to whether it's the spring tension or the spray opening that needs changing—no trial setting followed by a run to find whether it is right or not—no uncertainty about any point of the procedure. The float level, once set, is never changed; and the needle valve is the **ONLY** other thing about the carbureter to adjust.

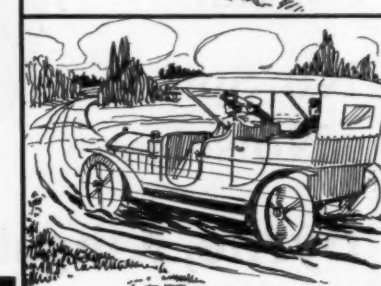
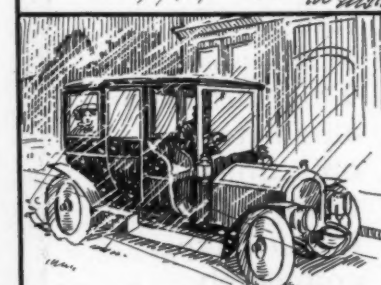
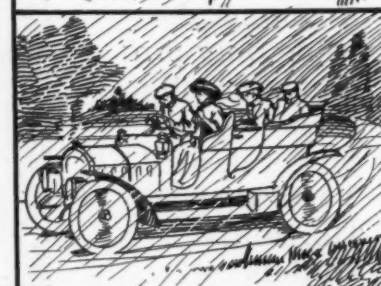
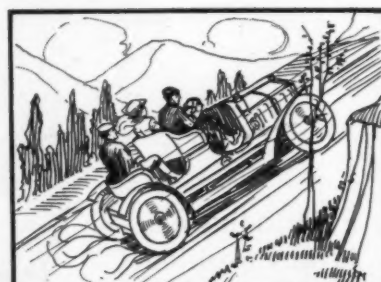
Regular Top or Side Outlet Models	
2".....	\$7.50
1 1/2".....	7.50
1 1/4".....	8.00
1 1/2".....	9.00

With Universal Joint and Dial Adjustment— Top or Side Outlet	
2".....	\$10.50
1 1/2".....	10.50
1 1/4".....	11.00
1 1/2".....	12.00

HOLLEY BROTHERS CO., Detroit, Mich.

SELLING AGENTS

New York City: New York Sporting Goods Co., 17 Warren Street
Pacific Coast: San Francisco, Calif., Geo. P. Moore & Co.; Los Angeles, Calif., Geo. P. Moore & Co.;
Oakland, Calif., Geo. P. Moore & Co.
New England: Hartford, Conn., Post & Lester Co.; Boston, Mass., Post & Lester Co.



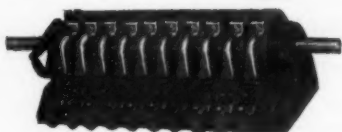
Why are the best electric vehicles so much better than the others?

The most important reason is that the best electric vehicles are equipped with suitable motors and controllers.

What constitutes suitable motor and controller equipment?



THE MOTOR must be designed to suit the working conditions under which a storage battery operates. It must accelerate rapidly with a minimum demand on the battery. It must take current only in proportion to the work done throughout the whole range of operation over good and bad roads, up steep hills and on the level at all speeds. It must utilize to the greatest degree all the current supplied.



THE CONTROLLER system must fully economize the battery charge. The controller must not arc, burn or stick. It must be sturdy, simple in construction, fool-proof and easy to operate. It must be properly proportioned so as to insure efficient use of current at low as well as at high speeds. It must impose no unnecessary shocks or strains on tires, gears or frame when accelerating, or at any other time. Its operation must be smooth and well graduated, combining maximum flexibility, smooth acceleration, reduced maintenance of battery, driving mechanism and tires.

Where can such a suitable system be obtained?

The General Electric Company's latest type of automobile motor (GE1020) and its "continuous torque" controller fulfill all the above requirements and when demanded by purchasers of vehicles and used by the builders will give the greatest mileage per battery charge with the least maintenance and repair charges on all parts of vehicles.

Who is using this system?

A majority of the largest and most progressive electric vehicle manufacturers throughout the United States.

1990

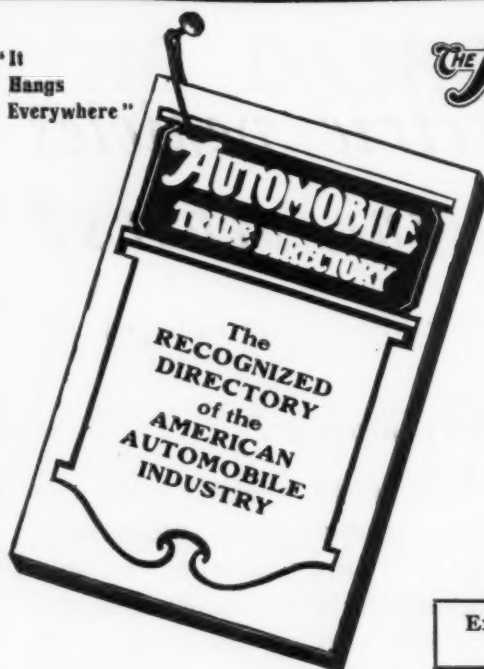
General Electric Company

New York Office
30 Church Street

Principal Office
SCHENECTADY, N. Y.

Sales Offices in All
Large Cities

"It
Hangs
Everywhere"



THE AUTOMOBILE TRADE DIRECTORY

will keep your product before **ALL** who specify and buy **EVERYTHING** used in the automobile industry. It is within arm's reach of the active buyers in every automobile factory, supply house, agency, garage and repair shop in the United States, Canada and Mexico.

The buyers in these concerns constitute the whole purchasing power in this tremendous field.

This Directory Is Their Guide

WHAT PURCHASING AGENTS AND
MECHANICAL ENGINEERS SAY ABOUT
THE AUTOMOBILE TRADE DIRECTORY

Extracts from a few, out of several hundred, letters received in acknowledgment of our October, 1908, issue.

MR. B. ROSENZWEIG, Jr.
Pur. Agt.
BUICK MOTOR CO
FLINT, MICH.

"Am in receipt of the latest edition of *The Automobile Trade Directory* and assure you that we deem it a very valuable addition to the buyer's desk. We have occasion to refer to it very often and it is very seldom that we are unable to find the information that we are after."

MR. DUFFIELD MILES
Pur. Dept.
STEVENS-DURYEA CO.
Chicopee Falls, Mass.

October 29, 1908.
"The writer very much appreciates your sending this *Directory* to us as we have occasion to refer to it very often, and it is of very material assistance to the writer in the purchasing department."

MR. W. P. BLANCHARD
Pur. Agt.
DE LUXE MOTOR CAR CO
Detroit, Mich.

October 24, 1908.
"The writer is in receipt of your October issue of *The Automobile Trade Directory*. We find this publication of great assistance in this department and wish to thank you very kindly for same."

MR. B. D. GRAY
Chief Engr.
AMER LOCOMOTIVE CO.
Providence, R. I.

October 23, 1908.
"I have no criticism whatever to make of *The Directory*, but upon the other hand find it very useful and complete."

MR. J. P. FOGARTY
Pur. Agt.
POPE MANUFACT'G CO.
Hartford, Conn.

"Thank you very much for copy of October issue of the *Automobile Trade Directory*. I refer to it continually and have never found it wanting."

MR. C. H. WARREN
Pur. Agt.
BAKER MOTOR VEHICLE CO.
Cleveland, Ohio

October 23, 1908.
"We find this *Directory* very useful in our daily work and it is used a great deal."

MR. GEO. H. MATHESON
NATIONAL MOTOR VEHICLE CO.
Indianapolis, Ind.

October 23, 1908.
"I have used your *Directory* more or less ever since it has been issued and find it indispensable."

MR. R. J. MALKMUS
Pur. Agt.
ADAMS VEHICLE CO.
New York, N. Y.

October 23, 1908.
"I have received this journal for the past year or so and have found it to be of great value in many instances."

MR. E. E. SWEET
Engr.
CADILLAC MOTOR CAR CO.
Detroit, Mich.

November 3, 1908.
"I find *The Automobile Trade Directory* very helpful and it is often referred to. It is not put on the shelf and allowed to get dusty, but is kept with other live reference books."

MR. P. H. LYON
CHANSOR & LYON MOTOR SUPPLY CO.
Los Angeles, Cal.

October 27, 1908.
"We desire to extend our thanks for your kind remembrance of us with a copy of the last *Trade Directory*. This book is of value to us."

If you wish to reach the men who specify and buy, advertise in

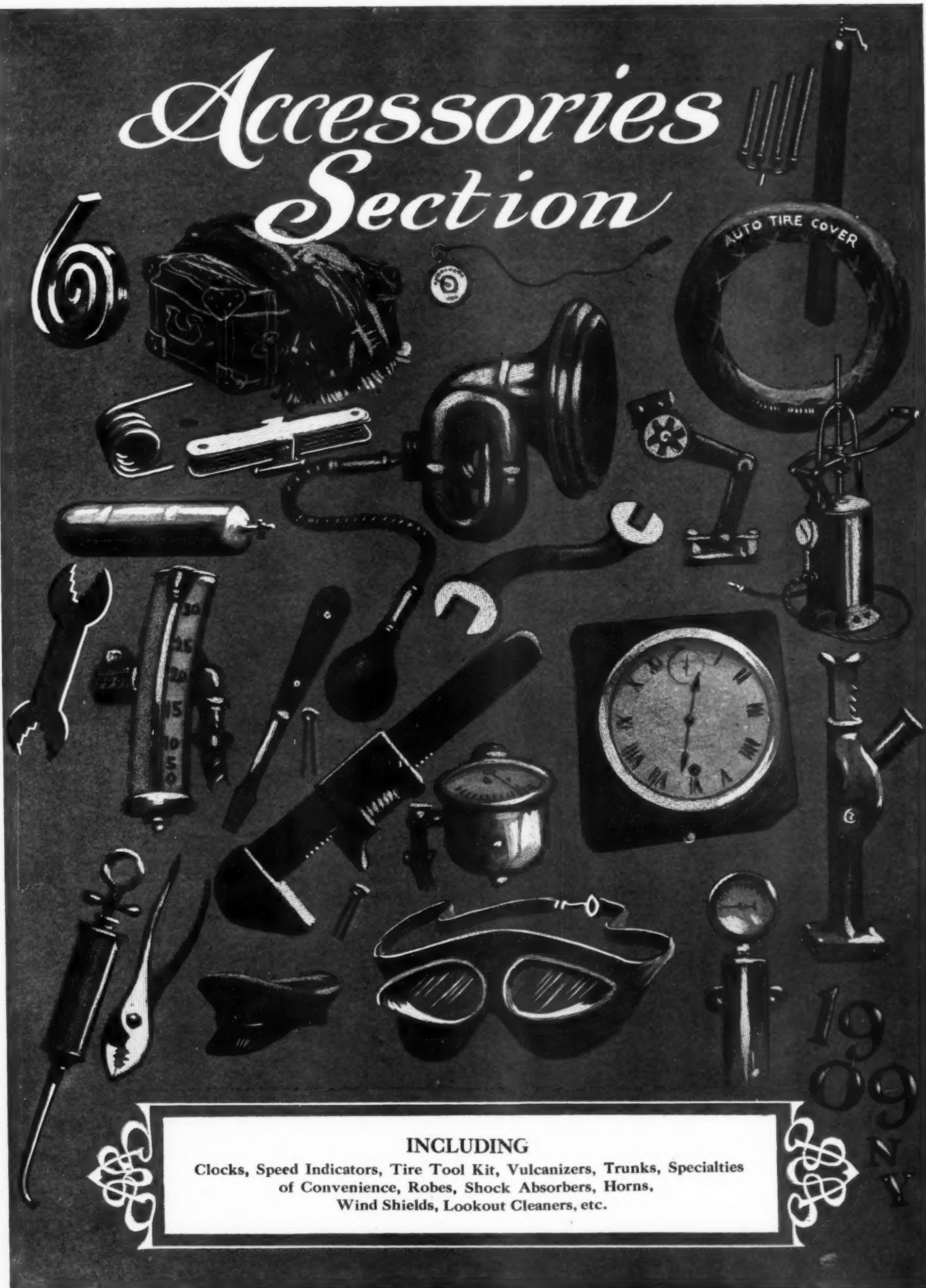
The Automobile Trade Directory

231-241 West 39th Street

New York

Advertising rates and full particulars sent on request

Accessories Section



INCLUDING

Clocks, Speed Indicators, Tire Tool Kit, Vulcanizers, Trunks, Specialties of Convenience, Robes, Shock Absorbers, Horns, Wind Shields, Lookout Cleaners, etc.

1909
AZA

THE JUSTLY CELEBRATED
8 DAY - HIGH GRADE

CHELSEA AUTO CLOCK



"SPECIAL"



"SAFETY" (Patent applied for) LIMOUSINE CLOCK—Practically Unstealable

	PRICE LIST				
Size	"ROUND"	"OFFSET"	"SPECIAL"	"LIMOUSINE"	"SAFETY" LIMOUSINE
2½ in. Auto Clock.....	\$26.00.....	\$28.00.....	\$36.00.....	\$28.50.....	2½ size only
3½ in. Auto Clock.....	28.00.....	30.00.....	45.00.....	Only made in	\$26.00 for the clock—not in-
3½ in. Motor Clock....	24.00.....	26.00.....	41.00.....	2½ in. size	cluding the Leathered Case

YOU want the BEST? Ask for the "CHELSEA"

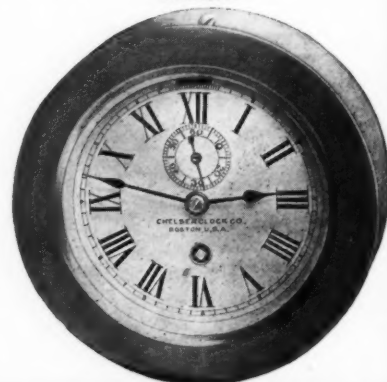
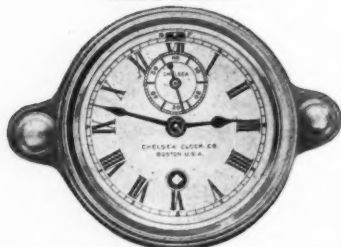
Why is it that { The Highest Class Jewelers
The Makers of Chronometers, etc.
The Largest Makers of Best Speedometers } DEMAND the
The USERS want and "CHELSEA" Clock?

There is a reason—They have stood the test of years AND MADE GOOD.

"LIMOUSINE"

"ROUND"

"OFFSET"



Primarily intended for use inside the bodies of large enclosed cars, and for such use its case can be given a variety of fine finishes. It also makes an attractive clock for use on dashboards. Only made in 2½ in. size.

CHELSEA CLOCK CO., 16 State Street, Boston, Mass.
Makers of High-Grade Clocks.

I N

ing
can
is
the
tha
pre
goo

S
sel
qua
is
so
the
bes
des
sub
wil
neo
inc
plic
pat
wit
and
aut

I
oro
to
bas
sec
ing
"to
ren
to
enc
Th
but
ma
pur
cen
to
put
tire
are
and
hor
var
utr
tire
the
pos



INTELLIGENCE displayed in the operation of automobiles should be by way of the use of proper accessories. Nothing but hands with which to cope with some unruly part of a car, under conditions remote from the haunts of the repair man, is pretty nearly sure to end with nothing but a horse to move the car. Conceding that automobiles are less prone to troubles than they were during the constructive period, it is well to be prepared when a difficulty does arise and emphasizes the need of good facilities.

Something by Way of a Tool Kit.—When it comes to the selection of the small tools to go into the kit for road work, quality should certainly take precedence of quantity. While it is to be hoped that no man will ever again own an automobile so designed that it will be impossible to get at the adjustments, the fact remains that the tool kit should include the very tools best suited to the given automobile. If socket wrenches are desirable in a given case, care should be exercised to select a substantial set. At all events a complete set of "S" wrenches will be found desirable and a good-sized pipe wrench will be necessary under certain severe conditions. A tool kit would be incomplete without a selection of monkey wrenches, snips, pliers, chisels, punches, drills, a dog or two, perhaps a heavy pattern pin-vise and a variety of files. A set of taps and dies, with a selection of bolts, an assortment of rivets, some solder and a blow lamp must all be included in an equipment if the autoist is to be confident and independent.

Fittings and Tools for Coping with Tire Troubles.—The ordinary "necessaire" included with cars is not sufficiently complete to enable an autoist to cope with tire troubles on an extended basis. The tire irons should be of good material and adequate section and the shape should conform to the requirements, differing somewhat on tires used. In former times a malleable iron "toothpick" lent zest to invective when autoists attempted to remove a tire case, especially if it had been in place long enough to adhere to the rim. The irons (toothpicks) were not long enough or strong enough or shaped for the work to be done. These details have been corrected to a very considerable extent, but it is always well for the individual to equip himself in a manner to suit his especial requirements. By way of repairing punctures, there are special patches to be had and fine grades of cement to be used with them and an "acid cure" that will aid to a marvelous extent by way of a permanent repair. Patches put on without any vulcanizing at all will not stay on if the tires heat up, which they do. In addition to these facilities there are tire chains that increase traction on these severe conditions and there are repair facilities such as enable the autoist to get home on a casing after a blowout. Of jacks there are a great variety and there is no gainsaying the fact that a jack is of the utmost importance. Moreover, it is well worth while to provide tire-saving lifts by which cars may be lifted off the tires when they are on storage. Tires are damaged if they stand in one position for a considerable time unless they are permitted to

assume their natural shape during that time if it is long.

Means for Inflating Tires.—The mileage that can be attained on the tire depends primarily upon the quality of the tires and the weight of the car in relation to the tire dimensions. These are matters to be settled in selecting cars, but after the selection has been made there is the further question of the inflation of the tires sufficiently for the purpose. An ordinary bicycle pump will not do at all, nor can it be said that a fair-sized "compound" hand pump will be up to a fitting standard for larger sizes of pneumatic tires. Makers, realizing the need of the occasion, had introduced divers forms of air pumps that are light and suitable for the purpose, including automatic engine-driven pumps attached to frame of car. Then again the compressed inflating gas tank has come into vogue and it serves for inflating the tires to a very satisfactory degree. The inflating gas may be carbonic acid which is in the liquid state of abregation in the tanks; this liquid will be under a pressure of approximately 1,200 pounds per square inch, which pressure changes with the temperature of the cylinder. As the surrounding temperature increases, so does the pressure, and for this reason it is always desirable to keep the tank in a cool place. The fact that carbonic acid is stored in liquid form is an assurance that the capacity of a relatively small tank will be capable of inflating a set of tires a considerable number of times.

This idea is a little new and tires are sufficiently expensive to engender caution when it comes to anything that might tend to deteriorate the fabric or the rubber. Autoists when they take to the use of tire inflating tanks are a little prone to question the qualities of inflating gases, due to the fact that carbonic acid, for illustration, will seep through rubber at a rate somewhat faster than that of air. In the absence of definite knowledge upon the subject, they naturally become perturbed and hastily arrive at the conclusion that the tubes are damaged in the process. Not so; the carbonic acid will stay in for a sufficient time to render the process practical and the consensus of opinion of tire makers (whom the author has consulted in relation to this matter) may be reduced to a few words as follows: Carbonic acid is just a little less likely to damage rubber than is atmospheric air. True, it will not stay in a tube as long, but it does not alter the structure of the rubber in its passage through the walls. As before stated, this is a matter of no great moment because the carbonic acid is inexpensive and obtains in the tanks in the liquid form under such high pressure that it is perfectly easy and simple to inflate the tires to the requisite hardness with but little effort.

The inflating tanks are made sufficiently strong to insure a large factor of safety and, again, the control of the exuding gas is not difficult because the liquid will not burst into gas at a high rate of speed. The idea, then, that the tires might be damaged by an inrush of gas at a high pressure is without foundation. Moreover, the needle valve is suitably designed with a very small orifice, which is a further assurance of safety as

against excessive pressure in the tires. On the other hand, it would be the height of fallacy to turn on the gas and go away; obviously the pressure would increase sufficiently to disrupt the tire within a short time.

Accessories to the Fuel System.—Gasoline is hungry for water, but the water should be separated out in the process of filling the fuel tank; foreign substances should also be removed. Funnels are made for the purpose, including a fine mesh sieve and a chamois skin water separator. The chamois skin will permit gasoline to pass through readily; not so with water. Likewise with the water-cooling system, foreign substances should be excluded if the chamois skin is demountable; the same funnel plus the sieve will serve to exclude foreign substances from the water.

The Utility of Shock Absorbers.—Classing shock absorbers as accessories it is even so desirable to emphasize their utility. No matter how good the spring suspension may be, there are conditions under which shock absorbers will pay for themselves by aborting spring breakages. And they have other advantages, among which we might mention a greater average speed on ordinary roads and more agreeable conditions of riding. Then, again, tires are not subjected to such great strains if the bouncing of the body is restrained. It is difficult to estimate the saving in tires due to the presence of shock absorbers. Shock absorbers are made in a variety of types, and it would seem from the extended use of the several types that utility resides in all. It would be reasonable to assume that the application should be consistent with the requirements and wisdom indicates that the conditions be considered as preliminary to the selection of the particular type of shock absorber.

Importance of a Signal System.—The approach of a car should be heralded in a suitable manner, and this is only possible if a siren, horn or other suitable equipment is provided. Ethically too much noise is objectionable, but there are conditions under which the right kind of noise in considerable volume will be justifiable. This important branch of the automobile accessory situation is admirably represented in divers ways with sirens, horns, etc., in great profusion. It is not believed the muffler cut-out should be regarded as a suitable noise system because it is not specifically placed with the idea of signaling the approach of a car and pedestrians might not pay attention to the noise of a muffler cut-out because of its non-specific character.

Measurements of Speed and Distance.—It is extremely important to be able to ascertain the speed at which a car is traveling. The autoist cannot tell if he is violating the speed laws if he has no means by which he can determine the speed at which the car is going. Barring instinct, it is impossible to estimate the distance in which the car can be stopped without knowing how fast the car is traveling. The distance in which motion can be arrested, if a traction system is involved, follows a natural law; in other words, the motion of a car can be arrested within the distance a car can be accelerated if the maximum tractive force is a maximum during the period of acceleration. Obviously the accelerating rate cannot exceed a certain point because the tractivity of wheel is limited. Equally true, the rate of minus acceleration is limited by the ability of the traction wheels. Instinct serves very nicely in the absence of instruments of precision with good judges of distance, but the automobile is used by people who are not good judges of distance, and it is desirable that they utilize the speedometers in order that they will know how fast they are traveling at any given time. It is also well to know the accumulated distance the car may have traveled, and it is a decided advantage to be able to ascertain at any given moment the distance traveled on a trip. These matters are all taken care of by competent speedometers geared to the front wheels of cars with the dial of the instrument located to intercept the eye of the autoist.

Accessories to Personal Comfort.—Until wind shields are made a regular equipment in connection with bodies of automobiles they will have to be classed with accessories. As a

matter of fact, these same wind shields come pretty near to necessities, and it is pleasurable to note that they may now be had in several forms, serving well their intended purpose.

Coming down to the more nearly personal questions, there is the question of goggles. They should be close fitting, easily adjusted, and they should stay adjusted. There are divers forms of goggles, some of which embody the mask idea, and the selection is largely up to the personal ideas of wearers.

There is one other question which is probably overlooked by autoists of no great experience, *i. e.*, the matter of wraps and robes. The way to keep comfortably cool on a hot summer's day is to ride at a fair rate of speed in an automobile, but under conditions of inclement weather it is plain to be seen that the very fact that one can keep cool on a hot day indicates that one will be cold on a cool day. Lap robes and other wraps are, therefore, extremely important and, strange as it may seem, the old conventional idea in connection with the horse-drawn vehicle were found valueless for the purpose. The wearing apparel in connection with automobiles was not reduced to its present form merely at the behest of a style maker. It was found necessary to depart from the conventions in this respect in view of the conditions wrought. Rain seems to have the special property of getting through everything but a thatched roof, and this property of rain is much accentuated when reference is had to automobiles in a storm of this character. A provision by way of storm curtains and waterproof wearing apparel is something that is overlooked sometimes, but it is of the utmost importance, and it is a matter that has been given exceeding attention by designers of accessories of the automobile.

There is one other matter that augurs for personal comfort, *i. e.*, a timepiece is generally placed on the dashboard so conveniently situated as to enable the occupants of the car to tell the time of day at will. This may seem to be a matter of no great moment in view of the universal use of watches, but it must be remembered that a watch is rather inaccessible under a top coat, especially if one has gloves on. It is much easier to glance at the timepiece on the dashboard. In town cars and in limousines the timepiece is placed flush in a case accommodating letter paper, pens, ink, blotter, etc.

In some notable instances cabinets are included.

Everything but the auto includes a vast list, the mention of which requires a catalogue. In the meantime it is fair to say that some of the accessories, so-called, are as necessities. Windshields, for illustration, can be regarded as accessories, and yet without them speed is even disagreeable. On a rainy day without a windshield it is impossible to keep dry, and if the road is dusty the windshield is necessary to safety. If goggles are used, and they are of a suitable design, the question of "insects" reduces to the tolerable, although windshields and goggles are more nearly in accord with the requirements.

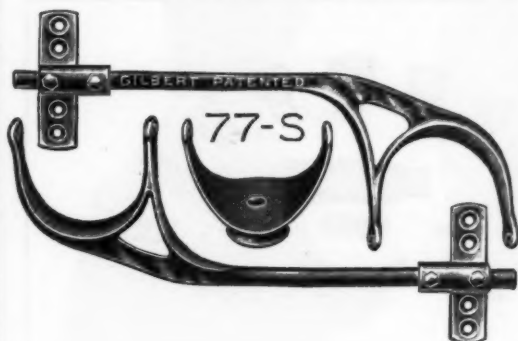
If the day is cold, steering becomes a task, since the wind will make its way up one's sleeves in the absence of gloves, or with them if the gauntlets are not so shaped as to go over the coat sleeve. Storm and cold protectors are to be had in the various designs as dictated by experience, which, together with fur-lined "over-pants" and such other means as are now available, renders winter touring pleasurable. Coats with flaps and button edges serve well their purposes, and military chestcoats are as good for the autoist as they proved to be in the service of the military.

If the weather is inclement, or if the roads are bad, it is then that tire chains show well their advantages. In the absence of, or even with chains, the several forms of "non-skid" covers are well worth the careful attention of the discriminating autoist.

But if it is desirable to be able to travel in bad as well as in good weather, over rough as well as poorly kept roads, it is equally well to know how far you go. The available instruments of precision to be had are as reliable as any device can be and they serve well the intended purpose. They not only tell the tale of the total distance for the car, but they tell of the individual trips and give the instantaneous value.

Gilbert Motor Car Accessories

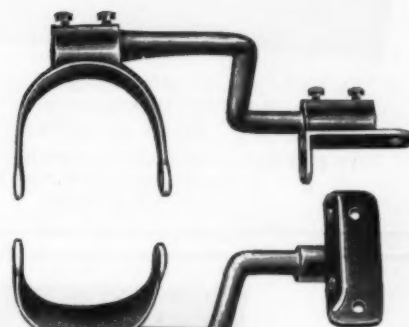
KNOWN THE WORLD OVER AND ACKNOWLEDGED THE BEST



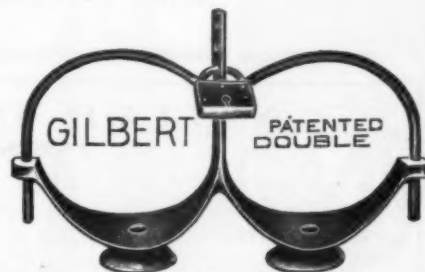
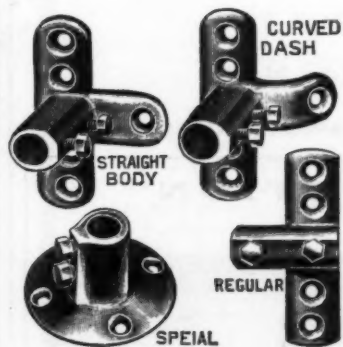
Styles
Wire
Edge

Styles
Buttoned
Fastened

Price, \$3.50



GILBERT
SET NO 66-S



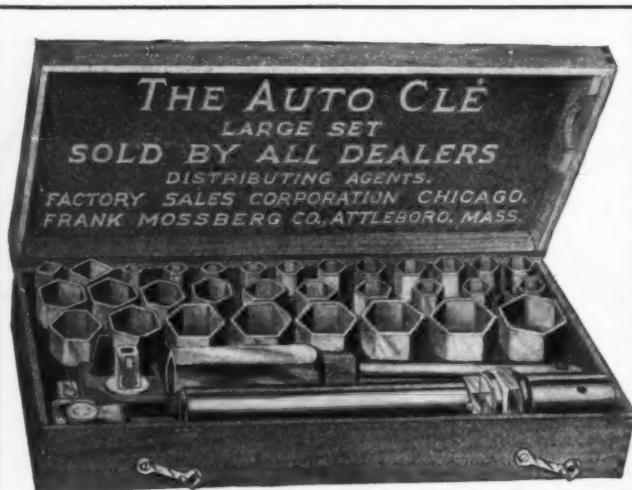
CATALOGUE READY FOR DISTRIBUTION

Our full line will be on exhibition at following shows: Grand Central Palace, space No. 158, section V, first gallery. Madison Square Garden, space No. 108, elevated platform.

We cordially invite our friends and customers to make themselves at home in our spaces during the show weeks.

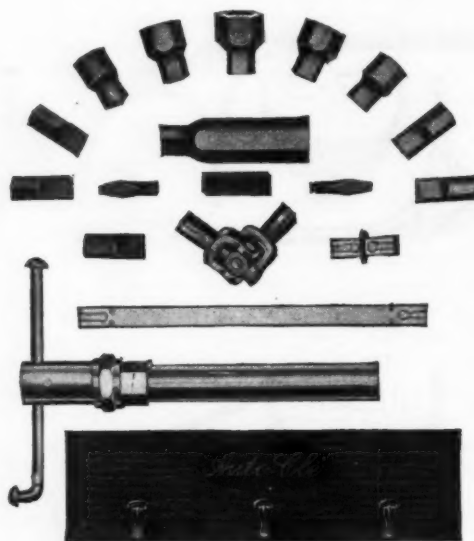
The GILBERT MFG. CO., NEW HAVEN, CONN.

THE STANDARD SOCKET WRENCHES OF THE WORLD
ALSO SOCKETS MADE FROM COLD DRAWN STEEL
THE AUTO CLE



PACKED IN NEAT WOODEN BOX, 30 STEEL SOCKETS,
 RATCHET HANDLE, SWIVEL JOINT,
 SCREW DRIVERS, ETC.

FITS ANY BOLT—REACHES ANYWHERE. THE BEST ALL
 AROUND WRENCH FOR SHOP
 OR GARAGE.



SMALL SET IN NEAT LEATHER CASE, 11 STEEL SOCKETS.
 PUT ONE IN YOUR CAR.



**AUTO CLE'S LITTLE
 BROTHER**

THE TITUS CLE WRENCH

NEW AND NOVEL

A SIMPLE FOLDING SOCKET WRENCH, COMPACT,
 CONVENIENT AND EXTREMELY
 USEFUL.

ASK YOUR DEALER

Manufactured by
QUINCY-MANCHESTER-SARGENT CO., Plainfield, N. J.

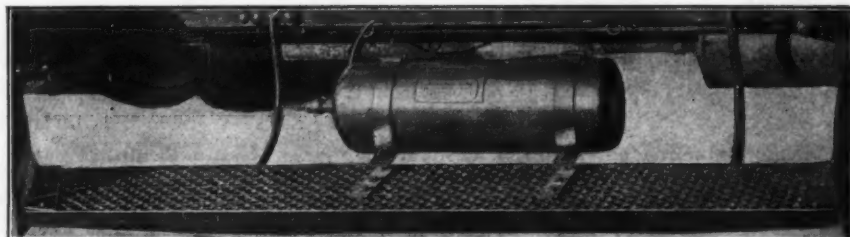
Distributing Agents

East: **FRANK MOSSBERG COMPANY, Attleboro, Mass.**

West: **FACTORY SALES CORPORATION, Chicago, Ill.**

A STEP IN THE RIGHT DIRECTION
INSIST ON HAVING THE STANWOOD

FURNISHED AS REGULAR
 EQUIPMENT ON MANY OF
 THE HIGHEST GRADE
 AUTOMOBILES MADE IN
 THIS COUNTRY.



Sole Agents: **FACTORY SALES CORPORATION, Chicago, Ill.**

SEE OUR EXHIBIT AT THE GRAND CENTRAL PALACE, SPACE 335



The Price Automobile Gauntlet possesses a number of exclusive points of superiority over other makes. Longer in both gloves proper and gauntlet cuff, the latter is not only wider when closed but is, as well, fitted with a folding gore which unclasp to admit the most bulky overcoat. It is the only gauntlet made which is specially reinforced where the wear comes—between the fingers and around the thumb. The wrist has a solid leather snap-strap. Lined or unlined. Price, from \$2.00 to \$10.00 per pair.



The Price Short Length Automobile Glove is a favorite for drivers who do not want a gauntlet cuff. It is fitted with a solid leather snap-strap at wrist and may be had either lined or unlined. Price, \$2.00 to \$4.00 per pair.



The Price Ventilated Automobile Gauntlet is made with a special ventilated back which effectually protects the hand of the wearer from the discomforts of perspiration. The greater part of the natural warmth of the hand is retained and still sufficient ventilation is allowed to permit the entrance of a cool, dry air, thus maintaining the normal body temperature. Made in horsehide with gauntlet cuff. Has folding gore equipped with two clasps and solid leather wrist strap with our special snap. Price, from \$3.00 to \$4.00.

Price Auto Gloves

WHAT are the points for which you look when you go to buy a new pair of auto gloves?

First and foremost comes quality, doesn't it?

And then there's style and comfort. How about it—have you discovered the gloves that exactly fill all of these requisites?

If you haven't found the glove you want, you haven't tried Price Automobile Gloves.

Price Automobile Gloves are made by particular people for people who are particular.

Stop a moment and think that over. Then let us explain just what it means.

First, there is the question of quality.

Price Automobile Gloves are made from genuine washable Horsehide leather.

We picked Horsehide for a reason—it is the leather we would use for gloves for our own personal use and it makes gloves that we are not afraid to back up with our reputation.

If you realize what our reputation means to us, you will realize how good Price Automobile Gloves are.

There's no cape nor sheepskin stock in them, no paper linings. There's nothing but Horsehide—straight Horsehide all the way through.

But Horsehide affects more than the wearing quality of a glove; it has a whole lot to do with the fit as well.

Wet weather or rain won't affect Horsehide. There is no shrinking nor stretching. Price Automobile Gloves hold their shape.

Just figure on the importance of that. And then there is the matter of style and comfort.

Space here won't permit our telling about these points in detail. But we might just say that Price Automobile Gloves are made to the shape of the human hand and are as dressy as it is possible for gloves to be made.

What's more, their style is of the type that has to do with full lengths in the parts of the hand where it is needed. You will find Price Automobile Gloves models of comfort.

The Price One-Finger or full Mitten, for example, is one of our favorites. It allows the hand all necessary freedom, and being lined with extra heavy Imported Lamb-skin, is exceptionally warm for winter wear. Price, \$2.00 to \$8.00 per pair.

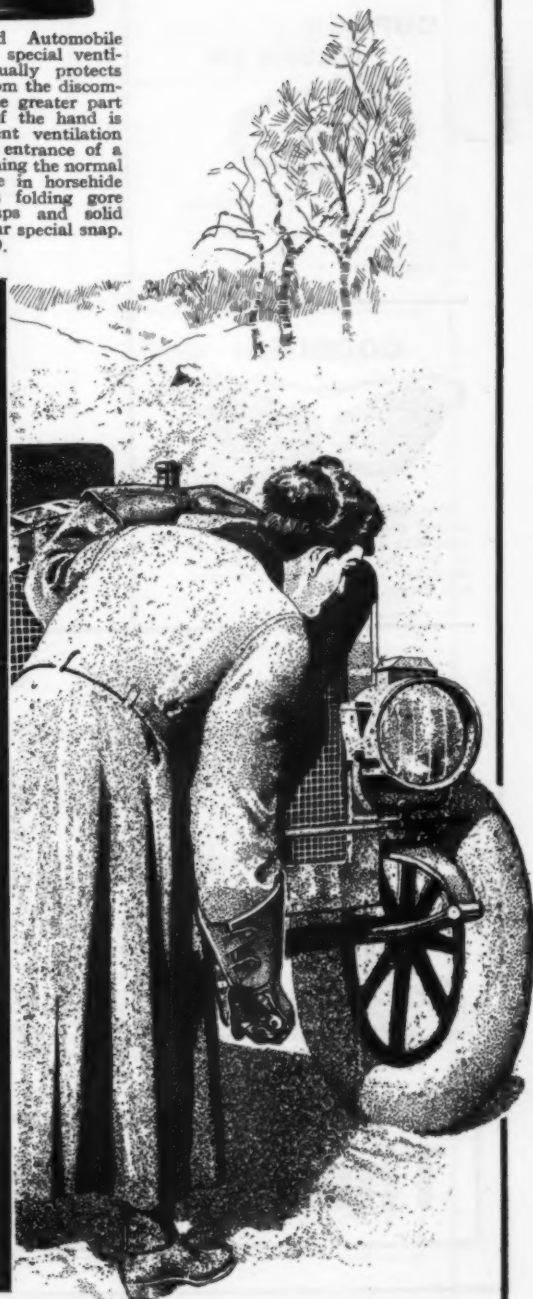
Price Automobile Gloves are tanned in reindeer, pearl, black, tan and buckskin colors—in the exact color you want.

They can all be had lined with Imported Lambskin or Blue Rabbit-skin. Incidentally, it might be mentioned that our Fleeced, Knit Lined Seamless Finger gloves—practically one glove within another—are mighty warm and comfortable for winter wear.

On request we will be glad to send our catalogue showing the complete line.

TO DEALERS: We want reliable dealers to handle our line. Write for special proposition to the trade.

HENRY W. PRICE CO., Dept. 25 Rockford, Ill.



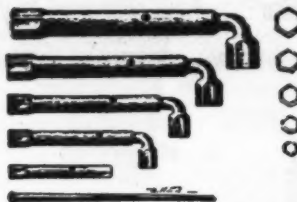
A Few of Our Imported and Domestic

BLANCHARD HORNS



THEY HAVE THE SOUND that made imported horns famous. There are over twenty-one different styles in up-to-date designs. Let us send you our Blanchard Horn catalogue.

SOCKET WRENCHES



Imported telescoping socket wrenches. They are especially adapted for auto use and should be in every tool kit.

Style C, four pieces and lever handle, \$5.00.

Style D, five pieces and lever handle, \$6.00.

COPPER GASKETS



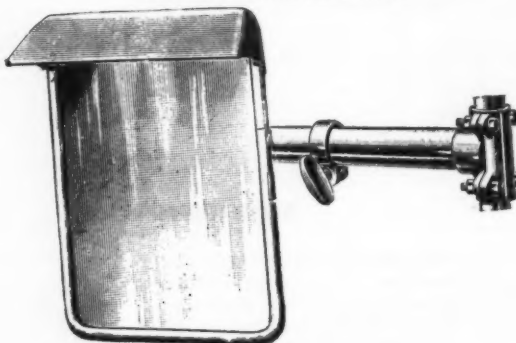
Our line of copper asbestos gaskets is the largest in the country. Every size, including 16ths, always in stock. Before purchasing get our prices.

GOGGLES



We make a specialty of imported goggles and carry a very extensive line. It will pay you to get our goggle catalogue showing the different designs and prices.

THE ARGUS MIRROR "IT PREVENTS ACCIDENTS"



SEE WHAT'S COMING!

If you could do this, half the accidents would be avoided. With the Argus Imported Dash Mirror (protected by a hood from the sun's rays or rain) you have a clear view of the road behind without turning the head. Adjustable to any position.

Price, less shield..... \$7.50

Price, with shield..... \$9.00

PIRELLI CABLE



That wonderful Italian cable that is used by every well-known auto manufacturer in this and other countries. Ask us to send you our sample card showing the different sizes and prices.

SPARK PLUGS



We carry a large stock of every imported and domestic plug on the market.

Renault Spark Plug, \$2.50.

A. V. Magneto Spark Plug, \$2.00.

Bosch Spark Plug, \$2.00.

Motorcycle Spark Plug, 75c., and many others.

ENGLISH TIRE PUMPS

They Reduce Tire Expense

These easy working English pumps require only half the time and half the exertion usually required by other pumps.

Air is pumped into the tire on both up and down stroke. Gauge on pump indicate pressure being pumped into tire.

Get an English pump and make tire inflation a pleasure.

English Compound Pump..... \$12.00

English Expansion Triple Pump \$18.00



TRIPLE PUMP



DOUBLE PUMP

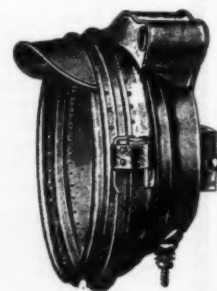
MOTOR CYCLE LAMPS AND GENERATORS



Beautifully designed headlights for motorcycle use. Very finely nickel plated. Will give steady brilliant light in any kind of weather.

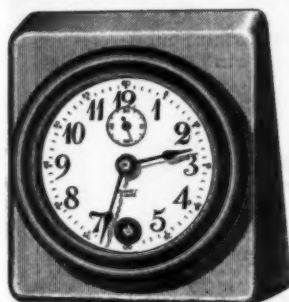
Set consisting of No. 53 A lamp and 53 B generator, \$10.00

Other styles and prices on request.



The MOTOR CAR EQUIPMENT CO.

Domestic Auto Specialties



THE "SAVOY" CLOCK

— 8 DAY —

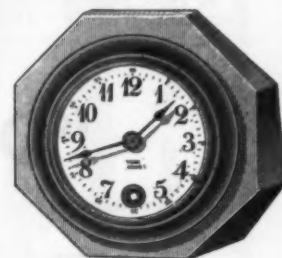
Specially designed to resist jars and shocks. Has elegant, quick-train movement. An exclusive model. French porcelain dial measuring $2\frac{3}{4}$ in. Water, dust and thief proof. Size, $3\frac{1}{2}$ x $4\frac{1}{2}$ in. Price, \$10.00.

THE "YORK" CLOCK

— 8 DAY —

The very latest design. High grade in every respect. Has no projections or obstructions that can be broken off. Water, dust and thief proof.

Heavy polished brass case. Dial measures $2\frac{3}{4}$ in. Size, $4\frac{1}{16}$ in. across. Price, \$7.50.



FOOT RESTS



Absolute necessities in every tonneau. They enable the occupants to brace themselves in a comfortable position and prevent the accidental scratching and damaging of the body of the car. These foot rests are constructed of heavy brass, highly polished and are adjustable. price, 32 in. long.....\$2.50

ROYAL MAGNIFIER HEADLIGHT



The Most Powerful Headlight Ever Produced

This latest model of Acetylene Headlight gives an intense light that can be seen for miles. It is fitted with a high-grade mirror lens Reflector in the back and a powerful 8-in. magnifying lens in front, this combination producing a powerful light. Price, large size, each.....\$27.50
Price, small size, each.....\$18.00

ROBE RAILS



Keeps robes and wraps from being crushed or soiled in bottom of car. Made of heavy brass tubing, highly polished.

Stationary, 24 in.....\$0.85
Adjustable folding rail, 33 in. 2.50
Adjustable folding rail, 35 1/4 in. 3.00
Folding rail with handle..... 3.00
Strap robe rail..... 2.50

FORK TIRE LEVER



A new style fork lever tire tool for removing and replacing security lugs and tubes in tires. Equipped with rollers, which prevent damaging tire while removing. Price, 50 cents.

LAMP BRACKETS



Our line of lamp brackets for side, tail and headlights embraces every conceivable shape and design. Let us send you our bracket catalogue.



ROYAL TIRE HOLDERS



Our line of tire holders is complete and varied enough to meet all requirements.

Royal double-tire holder, per set.....\$5.00
Royal single-tire holder, per set.....\$3.75
Simplex adjustable tire-holder, per set.....\$5.50
Globe cup tire-holder, per set.....\$2.00
Imperial lock tire-holder, per set.....\$7.50

ROYAL VALVE TAP AND DIE



With it you instantly unscrew the valve inside of any Schrader valve. With the die you can at any time cut a new thread on the outside of the valve and with the tap you can cut a new thread on the inside. This little accessory is the handiest thing for this purpose ever put on the market and should be in the tool kit of every automobilist.

Price..... 25c.

MAIN STORF

UPTOWN BRANCH

55 WARREN ST., NEW YORK

- 1727 BROADWAY

Good Jack Advice

"By all means get the best Jack you can"

■ Your jack is always used at the time when your patience is most sorely tried—that is, for tire trouble, or something worse. Don't invite further irritation at such times by using a poor jack. A few dollars, more or less, are not to be considered in comparison. However, a little investigation counts for more than dollars in selecting a jack.

"Don't Be Misled by Price"

Some manufacturers have to charge high prices for their complicated designs and construction.

"The Simplest Is Always the Best"

Our jacks, being built on the simplest design (and on the only correct principle) cost only $\frac{1}{2}$ to $\frac{1}{3}$ the "fancy" prices. They do all that the others do (and more), with half the parts.

Our models are built on the screw principle and are the best of this kind. Most others use the rack and pawl idea, with small, complicated parts and many other disadvantages.

Screw Jacks vs. Rack and Pawl Jacks

Simplicity—Few parts.
Strength—Strain comes on all parts evenly.
Easy—Lever turns screw only—doesn't lift direct.
Holds at any point—doesn't drop if you let go.
Small and compact—No loose parts to lose.
Easy to reverse—(Just touch ratchet).
Cleanly—Quickly adjusted to any height without soiling hands.
Etc., etc., etc.



Complications—Many parts.
Strain comes on small parts, teeth, etc.
You actually lift load yourselves by leverage.
Must be lifted from tooth to tooth. Drops back if teeth fail to catch.
Bulky—Handle always loose or separate.
Hard to reverse (sometimes impossible).
Hard to raise or lower without soiling hands.
Etc., etc., etc.

The Reliable Jacks

We manufacture a complete line of automobile, vehicle and heavy lifting jacks—six different models—all equally good, and all the best that are made for their purpose. Prices from \$2.50 to \$15.00, and the capacities from 2 tons (4,000 lbs.) to 10 tons (20,000 lbs.). Familiarize yourself with this line of jacks—or with one that fits your use. See them at the Automobile Show, at your supply dealers, or write us for literature and prices.

THE ELITE MANUFACTURING COMPANY
ASHLAND, OHIO

Buy from a house with
established^{an} reputation

TIMES SQUARE AUTOMOBILE COMPANY

(Extract from Instructions issued to Salesmen of Times Square Automobile Co.)

The Auto has come to stay; it has passed its costly experimental stage and although not yet fully standardized can be said to be as near perfection as we can reasonably expect. It is no longer a luxury but a necessity. The laws of supply and demand will regulate prices, and competition will protect the public against overcharge.

Really good, high-powered cars are in demand, but there is a daily increasing call for used small cars and this is readily accounted for when one considers the wisdom of getting valuable initial motor experience out of a small car, and it is no exaggeration to say that when an autoist really knows how to handle, drive, and make adjustments on a small car he is, without doubt, getting experience which will save him hundreds of dollars and much worry and trouble when he owns and drives a large car. It is a liberal education—this learning of a car and its uses and abuses—and should be preached by all of us in the Auto business. Our duty as men of business is not only to sell cars but to educate the buyers how to avoid trouble and expense.

The living up to the above is just "why" we are the largest dealers in New and Used Autos and Accessories in the World

We've over 300 new and used Cars on our floors ready for your inspection. We've no interest in pushing any one make of cars. We buy and sell for spot cash only. We pay no commission to chauffeurs. It must be distinctly understood these Cars are here to-day. They may be gone to-morrow. We cannot duplicate them, so decide promptly.

1907 ROYAL TOURIST, in excellent condition. Has had very little use. Completely equipped. A snap at.....\$1,500

1907 THOMAS 40 Roadster. Recognized as one of the best and most powerful on the market. Very quiet running. Exceptionally fine bargain at.....\$1,000

LOZIER, 7-passenger Touring Car. Thoroughly overhauled and newly painted, and in exceptionally fine condition. Complete equipment of top, gas lamps, etc. A snap at...\$1,200

FORD Runabout. Late model, with 30-inch wheels. Thoroughly overhauled, and in excellent condition. A bargain at.....\$350

30-horsepower TAXICAB, has been thoroughly overhauled and is in excellent condition. Has a very fine body and a bargain at.....\$900

COLUMBIA Electric Brougham. This car has just been thoroughly overhauled, and mechanically as well as in general appearance is in exceptionally fine condition. Has one of the handsomest bodies in the city. The greatest bargain in America at.....\$500

HUMBER Taxicab, recognized as one of the finest cars built in the world. Lots of power and turns within 25 feet. One of the most powerful Taxicabs in this city and the greatest bargain offered at.....\$2,500

WHITE STEAMER, 1907 Model "G," in exceptionally fine condition. Has been thoroughly overhauled and newly painted, and has a very large straight-line 7-passenger body. Best bargain in a Steamer in the city at.....\$1,250

Write for our Bargain List, 32 pages, post free. It's known and published as "The Times Square Automobile Bulletin."

1597-1599-1601

BROADWAY, NEW YORK

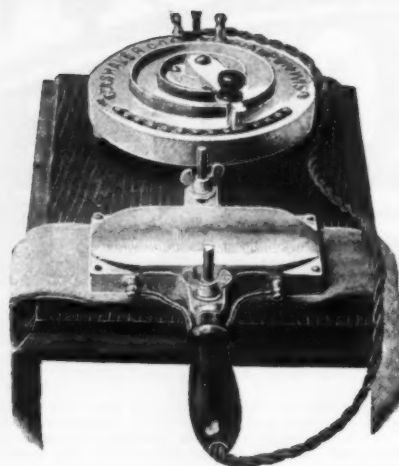
1332-1334

MICHIGAN AVE., CHICAGO

The largest dealers in new and used automobiles in the world

Don't pay outrageous prices

MAKE ONE TIRE OUTWEAR THREE



**AND REDUCE
REPAIR BILLS
75%**

You stop deterioration of your tires by keeping all cuts in the casings filled in with new live rubber. This prevents sand, dirt and water from getting to the fabric and rotting it. Rotten fabric means sand-pockets and blow-outs, SURE.

SHALER ELECTRIC VULCANIZER

Does the business.

Less than $\frac{1}{2}$ cent an hour running expense.

Perfect work guaranteed.

No knowledge of vulcanizing or electricity needed.

THE SHALER ELECTRIC VULCANIZER IS THE ONLY PRACTICAL PORTABLE VULCANIZER EVER MADE. IT IS THE ONLY ONE WITH A PERFECT AUTOMATIC HEAT CONTROL. NO DANGER OF OVER HEATING. YOU DON'T EVEN HAVE TO WATCH IT. IT DOES THE WORK ALL ALONE.

Let us tell you about it at the Shows.

Grand Central Palace—Second Floor—Space 153.

Madison Square Garden—Balcony—Space 202.

Chicago—Coliseum Balcony—Space 9.

C. A. SHALER CO., ^{Box} **R, Waupun, Wis., U.S.A.**

Write, or let us give you our booklet, "Care and Repair of Tires," at the Shows.

COES



WRENCHES

Give Satisfaction and
[Long Service]

FOR OVER SEVENTY
YEARS THE STANDARD

IMITATED BUT NEVER EQUALED

Costs little more than the imitation
and infinitely better. Bears the same
relation as the REAL DIAMOND
does to the "Near-diamond."

INSIST
ON THE
GENUINE

"Just as good" is but a tribute
to "Coes" superiority and
should be so understood.

COES WRENCHES EXCEL

Because they are the result of over
seventy years' thought and experience—
and the highest quality material and
construction.

You should have our Wrench book showing full line and descrip-
tion in detail. Write us to-day.

COES WRENCH CO., Worcester, Mass.



GABRIEL 1909



In order to maintain the high standard which the products of our factory have acquired, many improvements have been made in the 1909 models of The Gabriel Horn, The Gabriel Shock Absorber and The Gabriel Cut-Out Valve. Gabriel Products still set the pace which competing lines try to follow.

A POLITE REQUEST

The rich, mellow notes of THE GABRIEL HORN act as a polite request, not a harsh demand. It warns without frightening. By a new device its sweet musical three note tone used for city purposes can be caused to rise in unison for a penetrating warning on country roads. The Gabriel Horn is used exclusively on the personal cars of King Edward of England, Emperor William of Germany and other crowned heads of Europe.

1909 GABRIEL HORN AND CUT-OUT VALVE

We have perfected a new valve which is used both for operating exhaust horn and for cut-out purposes. For cut-out purposes remove the disc in main channel, thereby relieving back pressure from muffler through additional opening of 1 1/4 inches. Made to fit exhaust pipes 1 inch to 2 1/2 inch outside diameter. Warranted not to stick under any condition.

GOING UP

is pleasant enough, but coming down with a thud is what makes the nerves quiver and cry for

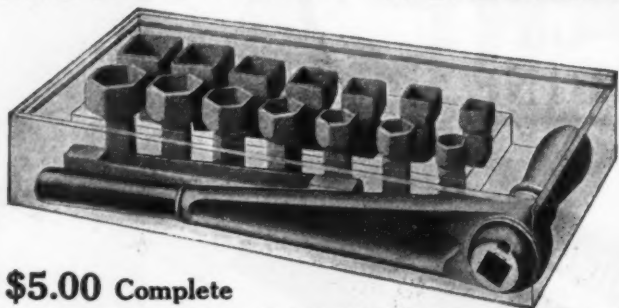
1909 GABRIEL SHOCK ABSORBERS

A retardating friction gradually applied in proportion to the shock takes up all jolts and jars, and makes riding over rough roads or bumpy pavements a positive pleasure. The 1909 Model has improvements which give increased bearing surface, eliminate noise or rattle and greatly increase its efficiency and durability. Thermoid used for friction pad. Can be attached to any car or any type of spring.

Write for booklet illustrating and describing our 1909 products.

GABRIEL HORN MFG. CO.
1410 East 40th Street
CLEVELAND, OHIO

MULTO SOCKET RATCHET WRENCH



\$5.00 Complete

Will Reverse and Work Right or Left Handed, without removing the Wrench
LOWELL WRENCH CO., 100 Exchange St., Worcester, Mass

E. Flentje's Improved Glycerine Hydraulic Jounce and Recoil Preventer

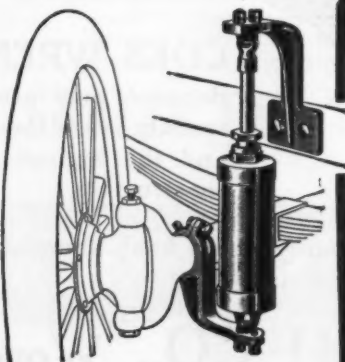
for Automobiles
 Patented Sept. 29, 1908

Best in the world when patented. \$2,000 against \$1,000 to any shock absorber manufacturer who can disprove my statement. To show my confidence in my invention, 60 days on trial and one year guarantee.

For catalogue, testimonials and full particulars of the merits of my device, please send to

ERNST FLENTJE

1843 Cambridge St., Cambridge, Mass.

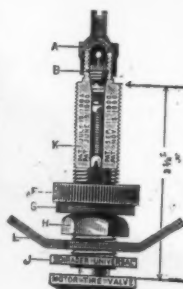


ESTABLISHED 1844

SCHRADER UNIVERSAL VALVES

(Trade Mark Registered April 30, 1895)

SIMPLE AND ABSOLUTELY AIR TIGHT



Schrader Universal Motor Tire Valves, as shown in cut, are the regular equipment for G & J Motor Tires, Hartford Dunlop Detachable Motor Tires and New Goodyear Detachable Motor Tires.

Our No. 777 Motor Tire Valve is the standard for 2 1/2 inch and 3 inch Tires, and our No. 725 Motor Tire Valve is the standard for tires larger than 3 inches.

SUPPLIED TO THE TRADE BY ALL TIRE MANUFACTURERS

Manufactured by

A. SCHRADER'S SON, Inc.,

28-30-32 Rose Street,

NEW YORK.

We Are the Largest Jobbers of AUTOMOBILE SUPPLIES



¶ We carry in stock at all times the most perfect assortment of automobile supplies in the United States, and your order can be shipped promptly and the best attention given it, owing to our large stock.

¶ Our new catalogue system is of the loose-leaf form. It has been endorsed by the leading dealers and manufacturers in the trade. You cannot afford to be without this on your desk. We keep it up to date for you. This is something new. Write for a general description of it and be convinced. Our flyers are issued to you monthly.

¶ Try a barrel of our GENESEE LUBRICATING OIL—Hi Lo Brand. This oil is practical for any kind of weather and will meet with approval with your trade.

¶ We will extend you courteous and generous treatment at all times. We respectfully solicit your valuable patronage.



Flint, Mich.



GET READY FOR WINTER— EQUIP YOUR CAR WITH A JOHN BOYLE TRUNK

Don't travel inconvenienced by baggage as in illustration above and subjecting the contents to damage from the weather, but GET A JOHN BOYLE TRUNK and travel in comfort, safety and style, with your baggage strapped out of your way at rear of car in a strong, weather-proof, thief-proof trunk. Easily accessible en-route, or at your destination unstrap and send into your rooms.

Indispensable for carrying every requirement of toilet and dress—you are ready for any emergency regardless of weather changes or stop-overs en-tour.

Don't be wheedled into believing there are trunks "just as good" as the John Boyle make—they are not. The John Boyle Trunks are the superlative in Auto Trunk construction, imitated but never equalled.

Each of the wide range of models is a masterpiece of

Quality—Style—Lightness—Strength—Compactness—Capacitousness—Accessibility—Absolutely Weather and Dust Proof

A good car deserves good equipage—why not get the BEST—the JOHN BOYLE MAKE—and secure lasting satisfaction.

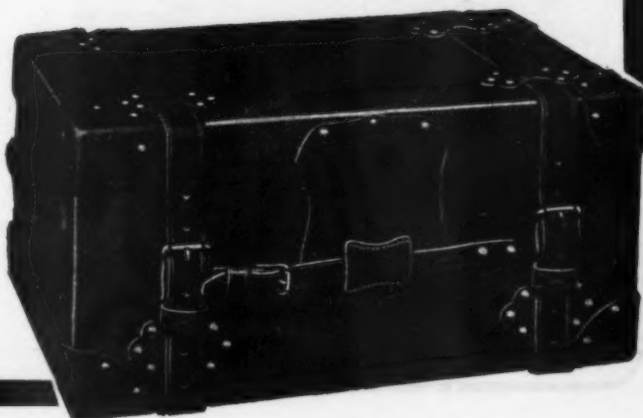
JOHN BOYLE & CO.

112-114 DUANE ST.

70-72 READE ST.

NEW YORK

Write for Style Book and Prices for the Various Makes of Cars



ARE YOU A WINTER MOTORIST?

Then you either know now or soon will—by expensive experience—that the best, cheapest, and cleanest “anti-freeze” solution for your radiator is just plain, ordinary wood alcohol and water in proper proportions to withstand the temperature you encounter. We don’t make wood alcohol—or water either—but we do make

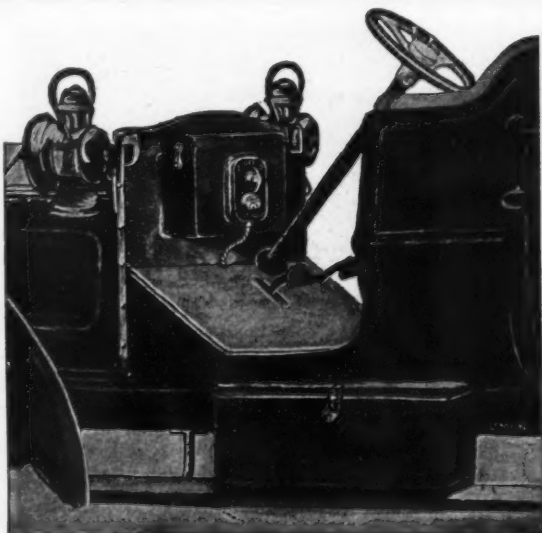
THE ALCO-METER

(PATENTS PENDING)

which tells you instantly and infallibly what percentage of alcohol there is in your solution and what degree of cold it will withstand. Commercial wood alcohol varies greatly in strength, and you cannot mix nor maintain a satisfactory solution without an Alco-Meter. With one you KNOW what percentage your solution is and what degree of cold it will resist, and you can definitely vary your mixture as the weather gets colder in the fall or warmer in the spring. It’s as indispensable in winter as gasoline. Don’t be the man who “thought” he “knew” and “saved” the price of an Alco-Meter and had a freeze-up. He bought one *after* he saw the repair bill. Get *yours* before. DO IT NOW.

We will deliver an Alco-Meter anywhere in the United States on receipt of price, four dollars, and absolutely guarantee satisfaction or money refunded without question.

LARCHMONT MFG. CO., Larchmont, New York



GASOLINE CAR LOCK INSTALLED

represents our lock for electric vehicles, which are installed on arm of seat in place of the ordinary cutout or plug.

Insist on having your new car equipped with one of these devices

SAFETY DEVICE CO., Mfrs., - Indianapolis, Ind.

BRANCHES

Skinner & Skinner, Chicago, Ill.
Herbert F. Reid, Cleveland, O.
G. L. Wands, Savoy Hotel, Denver, Col.
A. A. Duebel, 154 Ellicott St., Buffalo (State Agt.).

H. I. Sackett Elect. Co., Buffalo, N. Y. (Erie County).
F. E. Spelman, 127 Warren Ave., Boston, Mass.
Geo. A. Deckert, 614 Eighth St. So., Minneapolis.
M. H. Cormack, Motor Mart Bldg., New York City.

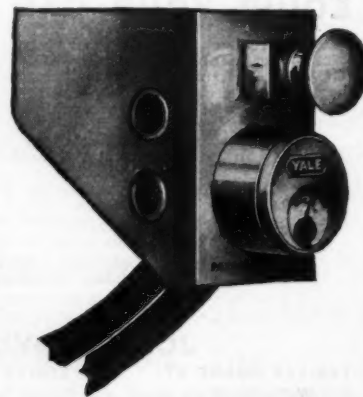
The Break Circuit Auto-Lock

**IS GOING TO FEATURE LARGELY IN THE
SALE OF 1909 CARS**

This is the first absolutely practical Lock-Switch that has ever been put on the market, and must not be confused with those devices which can be easily wired around or short-circuited. This lock is so constructed and installed that it cannot be “fooled with.”

The cut to the left of this page shows the neat and inconspicuous position in which the switch is installed on the coil box, doing away with the old switch entirely.

The cut to the right represents



"AS GOOD AS THEY LOOK"

"B"-Line Guns

BETTER THAN EVER

HANDLE OILS, GREASES
AND GASOLINE

IDEALLY

All metal construction cuts out leakage and puts
the lubricant where it is wanted

THE
NEW PRICE LIST

To take effect January 1, 1909, will triple
their sales.

OUR NEW BOOKLET "GUNS AND GAUGES" TELLS THE WHOLE STORY
MAY WE SEND IT?

THE RANDALL-FAICHNEY COMPANY

BOSTON, U. S. A.

AUTO DEPARTMENT—P. O. BOX 5300

"NO SOLDER—NO BOTHER"

Webster Gauges

IMPROVED AND PERFECTED

MAY NOW BE APPLIED WITH-
OUT SOLDER

to any standard car, motor cycle or launch
in less than ten minutes. *You* can do it.

Our *new cutter* makes a perfect hole in
round as well as flat tanks.

These improvements make the
Webster Gauge a standard ac-
cessory without a peer.

NONPAREIL HORNS

The superiority of NONPAREIL HORNS is acknowledged by Manufacturers, Jobbers, Dealers and Consumers.
The fact that we have closed contracts with 90% of all the Automobile Manufacturers speaks for itself.

This is no **exaggeration**, BUT THE ABSOLUTE TRUTH.

Our statement is also sustained by the fact that we have 35,000 square feet of space devoted exclusively
to the manufacture of Automobile Horns, and we cheerfully extend a hearty invitation to any one desirous
of inspecting our three plants, which are located at

Nos. 139-147 EMERSON PLACE Nos. 120-124 TAAFFE PLACE
Nos. 218-220 CLASSON AVENUE

where they can see 246 men at work.

We have added this year a new line of Horns, patented, that for **NOVELTY, COM-
PACTNESS of CONSTRUCTION, RICH, PENETRATING TONE** and **REASONABLE
PRICES** are attracting the attention of the trade in general.

AUTOMOBILE SUPPLY MFG. CO.



The Novelty of the Coming Season.
Patented

139 to 147

Emerson
Place

Brooklyn
N. Y.



This Largest Oval Horn, with deep, far penetrating tone,
is very familiar to the maker of high-class cars.

Hill's Improved Auto Specialties



Drip Pans, Measures and Funnels for Oil and Gasolene—Oily Waste Cans, Etc.

ESTIMATES FURNISHED ON SPECIAL WORK DEALERS, WRITE FOR OUR 1909 PROPOSITION

HILL DRYER COMPANY, Worcester, Mass.

Visit our exhibit No. 513, Basement, Madison Sq. Garden Show

"THE STAR"



Scale 50 miles. Price \$25.00.
STYLE No. 960

The best popular priced Speedometer on the market. We give 30 days in which to prove it. Write for Catalogue and full particulars.

STAR SPEEDOMETER COMPANY, Danville, Penna.
New York City, 1679 Broadway. Boston, Mass., 222 Eliot St.
Phila., Penna., Geo. W. Nock Co., 126 N. 4th St.

**LOOK!
READ!
\$15.00**



PEERLESS SPEEDODOMETER

with a 3-inch speed dial and hand reading from one to sixty miles, 10,000 season and 100-mile trip odometer complete with everything ready for attaching, \$15.00; with maximum hand, \$18.00.

This EXCEPTIONAL offer for advertising purposes on our regular \$30.00 instrument holds good until May 1st.

We have extended our special offer to above date by request of numerous prospective customers, who have not bought their cars.

PEERLESS SPECIALTY COMPANY

Broadway and 62nd Street,

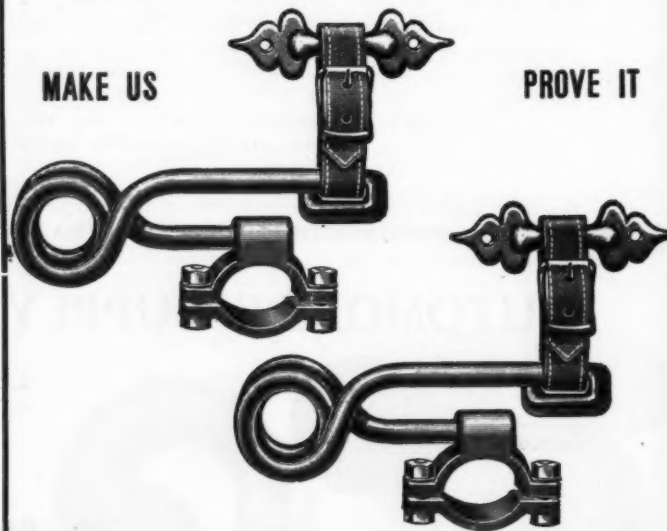
Department 4
Phone 5091 Columbus

NEW YORK

THOMAS SHOCK ABSORBERS PREVENT SPRINGS BREAKING

MAKE US

PROVE IT



You don't have to BUY Thomas Shock Absorbers to TRY them. We will send them to you to use for 30 days, at our expense. If at the end of that period you do not believe that they positively eliminate upthrow, thus ensuring easier riding—more speed—less wear on tires—NO BROKEN SPRINGS and fewer repairs, just send them back. Could anything be fairer? Can we make our guarantee stronger? Remember you have nothing to lose—everything to gain. Send for full particulars—they are worth real money to you.

BUFFALO SPECIALTY CO., 370 Ellicott Street, Buffalo, N. Y.



Model G
Regular
Price
\$15
Special
Price
\$15

FROM FACTORY TO YOU

SAVE THE MIDDLEMAN'S PROFIT ON

The Hicks Speed Indicator

BUY DIRECT FROM THE MAKERS

\$15 For the
\$25
Instrument

\$25 For the
\$50
Instrument

Maximum Hand, \$3.00 extra.
Electric Light Inside Case, \$5.00 extra.

The Cheapest Prices at Which High-Grade Accurate
and Reliable Speed Indicators Were Ever Sold

The Hicks Speed Indicator is too well known and by long and successful service its reputation is too well established to need comment. There is no better or more reliable indicator made anywhere at any price. These are proven facts. On the market since 1905 and not 2 per cent ever returned for repairs. One of these speedmeters has been on a New York Central engine since January 1st and traveled over 20,000 miles without any breaks or repairs whatsoever. Written guarantee with every instrument.

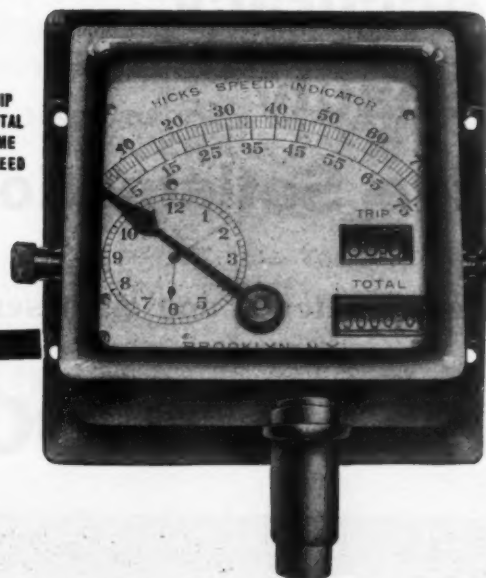
An opportunity for money-saving you should not miss.

In ordering, give make, year and model of your car.

Terms: Cash with order, or C. O. D. if order is accompanied by 10 per cent. deposit. **ORDER TO-DAY**

LONG ISLAND AUTO SUPPLY MFG. COMPANY

Office and Factory, 31-33 Grant Square, Brooklyn, N. Y.



TRIP
TOTAL
TIME
SPEED

Model E
Regular
Price
\$50
Special
Price
\$25

"It's nice to know how far you go;
And this will show the speed,—also."

Veeder TACHODOMETER

THE SCIENTIST'S SPEED INDICATOR

Registers how far, total, and for each trip. Double scale shows each speed at all times, from zero to 62 miles per hour.

**ONLY SPEED INDICATOR THAT CAN BE ACCURATELY
SET TO ZERO AT ANY TIME BY THE OWNER.**



Ball
Bearing
Through-
out

No Springs, Magnets or other
variable elements.

No delicate mechanism.

Only One Moving Part.

Price, complete, ready
to put on any car \$50.00

Thousands of Veeder
Odometers in use to
one of any other make.

The Veeder Mfg. Co.,
22 Sargeant St.,
HARTFORD, CONN.



Represented in Great Britain by
Messrs. Mark & Co., Ltd., 6 City
Road, Finsbury Square, London,
E. C., England.

FORM D or DASHBOARD ODO-
METER. Complete with flexible
shaft and attaching fixtures, ready
to put on any car, \$28.00

Stewart

THE TALK OF

The Greatest Achievement
the World



\$15.00 \$25.00 \$40.00

Built for Service
Built for Accuracy
Built for Beauty
Built to give Satisfaction

Built to make every car owner an enthusiastic believer and endorser of
STEWART SPEEDOMETERS.

STEWART & CLARK MFG. CO.

Speedometers

THE SHOWS

**in Speedometer Construction That
Has Known**

**There are more "Stewarts" sold
than all other makes combined**

Nearly all the jobbers handle Stewart Speedometers exclusively. Their experience has taught them that no other Speedometer can give the same satisfaction.

Car Manufacturers, Jobbers, Dealers and Owners all
say "THE STEWART FOR US."

GUARANTEED FOR FIVE YEARS

DON'T FAIL TO VISIT OUR EXHIBIT

**GRAND CENTRAL PALACE
Booth 143**

**MADISON SQUARE GARDEN
Concert Hall**



502 Diversey Boulevard, Chicago, U. S. A.

BUCKEYE AUTOMOBILE JACKS

In all sizes, suitable for any size
and style automobiles made



For cars weighing from 500 to 8,000 lbs., the largest variety
of sizes made by any Jack Manufacturing Company in America.
Read the list.

No.	Capacity Ton	Height Bar Down	Raise of Bar	Height Bar Raised	Weight Lbs.	Size of Base
0	1	12"	6"	18"	9	3 $\frac{3}{4}$ " x 5 $\frac{3}{4}$ "
05	1	12"	6"	18"	9	3 $\frac{3}{4}$ " x 5 $\frac{3}{4}$ "
02	1	12"	6"	18"	8 $\frac{3}{4}$	3" x 5 $\frac{1}{8}$ "
01	1	8 $\frac{3}{4}$ "	5"	13 $\frac{3}{4}$ "	8 $\frac{1}{4}$	3" x 5 $\frac{1}{8}$ "
01	1	9 $\frac{1}{4}$ "	5"	14 $\frac{1}{4}$ "	8 $\frac{1}{4}$	3 $\frac{3}{4}$ " x 5 $\frac{1}{8}$ "
03	1	10"	5 $\frac{3}{4}$ "	15 $\frac{3}{4}$ "	5 $\frac{1}{2}$	2 $\frac{5}{8}$ " x 4 $\frac{1}{2}$ "

The Nos. 0 and 05 intended for the heaviest Touring Cars
with 32" to 36" wheels.

The No. 02 intended for the heaviest Touring Cars with small
tool boxes.

The No. 01 intended for heavy Runabouts and heavy Touring
Cars with 9" axle clearance.

The No. 03 for light Runabouts and light Touring Cars up to
3000 lbs. Designed especially for the many new light
Touring Cars just coming out.

The only Jacks made from High Carbon Steel Drop Forgings
Guaranteed the best material, the best workmanship and
the best finish of any Jacks on the market. Get our prices
before placing your orders. WE WILL SAVE YOU MONEY.
Everything we say and do is fully guaranteed.

THE BUCKEYE JACK MFG. CO.
LOUISVILLE, OHIO

The Spencer Power Air Pump

Inflates Largest Tires
in Less Than Two
Minutes.

The Motor
Does the Work



THE AUTO PUMP CO.,
14 Main St., Springville, N. Y.

Write for circular.

DISTRIBUTORS:

S. F. HEATH & CO. Boston, Mass.
288 Columbus Ave.,
GEO. W. EDGE St. Louis, Mo.
3924 Olive St.,
AMERICAN AUTOMOBILE CO.
187 Wisconsin St., Milwaukee, Wis.
GEO. P. WELLS
472 Golden Gate Ave., San Francisco, Cal.
THE AUTO PUMP CO.
101 W. 66th St., N. E. cor. Broadway,
New York.

Overhead Vehicle Washer

BEST MADE FOR GARAGES



(Plain or Illuminated)
SEND FOR PRICES

Vehicle Specialty Corp., Hartford, Conn.

The Best
of
EVERYTHING
for
EVERYBODY

That Ever Drives
a Motor Machine

WRITE FOR CATALOGUE 70

**EXCELSIOR SUPPLY
COMPANY**

Established 1876

233-235-237 Randolph Street
CHICAGO

Equip Your Car With The New Idea Auto Light

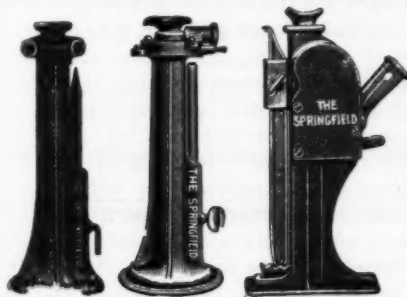


1-16 Size.

and you will always be able to locate "trouble" without fire danger. Hangs from any part of car desired and can be used for a working light in ANY position. It's a portable electric light plant. Lift bulb off hook and it's lighted to stay lighted until hung up again. Big bulb in master reflector gives brilliant light. Equipped with long elastic bulb cord and perpetual battery, price \$30. Order to-day.

**THE NEW IDEA
SALES CO.**
Dept. T. A.
CORNING, N. Y.

SPRINGFIELD JACKS



No. 1

\$1.50

No. 2

\$2.00

No. 3

\$4.00

SHAWVER CO., Springfield, O.

HALF PRICE

To clean up Surplus Stock

**Semi Annual
CLEARING SALE**

of

**Automobile Supplies
and Accessories**

Send for Flyer No. 18

**NEUSTADT AUTOMOBILE
& SUPPLY CO.**

3064 Olive Street, St. Louis, Mo.

Triumph Valve Remover Adjustable Ball Joints



HERE IT IS
IN ACTION
No waste of time

No broken finger nails. Fits any Gasoline Engine.

Patented April 24, 1908

P. O. Order for \$1.00 and the Remover will be sent you postpaid.

Manufactured by

MECHANICAL & ELECTRICAL MFG. CO.

Enables you to remove valve key or valve spring with no side strain or bending of valve stem. Price, \$1.00 each. Discounts to manufacturers and jobbers. For sale by supply dealers throughout the United States. If your dealer cannot supply you send us

for throttle and spark levers, connecting car buretor and timer with levers on wheel steer, eliminating all lost motion and giving a more perfect control to these levers at all times Easily and perfectly adjustable.

Adjustable stock size, steel, 40c ea. Adjustable stock size, brass 50c ea. Non-adjustable stock size, steel, 20c ea.

50 N. Desplaines St., CHICAGO

SCREW

SOCKET

For Spark & Throttle Levers

D 5/16 T 18

PRICE, 40c

Cut shows exact size

← BALL

D 10 T 32

The Practical Gas Engineer. What to Do and How to Do It. A book of 150 pages, neatly bound in cloth. Sent postpaid for \$1. Address Book Department, The Automobile, 231-241 W. 59th St., New York.

HOFFECKER

"STEADY HAND"

SPEEDOMETERS

are made for very particular people, those who want nothing but the best, whatever it may be. While being the best—deliberately designed and constructed to be so—it is not high priced. It costs less than some, more than others. The price is very reasonable and, service considered, little enough. The Hoffecker is built to last and to be true as long as it does last, to be first-class all the time. To own a Hoffecker Speedometer is to declare yourself to be one who knows what is right and indicates good taste and judgment.

The Hoffecker shows you plainly and accurately: how fast you are going, not in hops and jumps forward and backward, but steadily; how far you have gone on your trip, and can instantly be set back to zero for the next trip's record; the total mileage of the season's run. It is positively accurate at all speeds and under all conditions, governed wholly and truly by the speed of the car. "The Steady Hand" is exclusively a Hoffecker feature, making all indications without fluctuations and keeping an unwavering indication over the roughest roads. The Hoffecker carries an unrestricted guarantee as to reliability, durability and efficiency. It is something in which you should immediately interest yourself. May we send you a catalog—worth your while to look over—to-day?



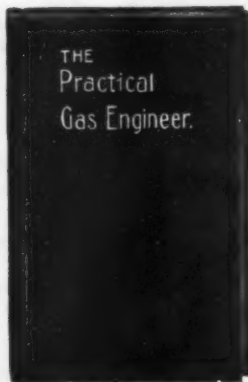
The Hoffecker Co., Motor Mart, Park Sq
Boston, Mass.

New York, 1775 Broadway
Washington, C. T. Willbur, Agt.

Cleveland, O., 1845 Euclid Ave.
Los Angeles, Cal., H. A. Lansford, Agt.

To Know What to Do and How to Do It

When your gasoline motor or gas engine gets stubborn, can be quickly learned by owning a copy of the



A Book of 172 Pages
Neatly Bound in Cloth
Sent postpaid on
receipt of price, \$1.

Practical Gas Engineer

By E. W. LONGNECKER. Twelve years' constant experience with Hydro-Carbon Engines.

SIXTH EDITION JUST OUT and selling rapidly. First and Second Editions exhausted in thirteen months. Special Chapter on Automobile and Motor Engines

How to start, how to operate, and how to care for all classes of explosive motors or engines using gas, gasoline or similar fuels.

A full and exhaustive chapter on electric and other systems of igniting.

Also chapters covering in a thorough manner troubles and remedies encountered in operating engines in motor vehicles, launches, shops or on the farm.

Every line tells something.
Every page full of interest.

The Class Journal Co.

231-241 W. 39th St., New York

Self-Propelled Vehicles

By JAMES E. HOMANS, A.M.

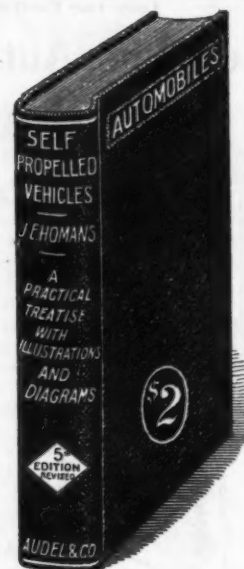
A practical treatise on the theory, construction, operation, care and management of all forms of automobiles, with upwards of 500 illustrations and diagrams, giving the essential details of construction and many important points on the successful operation of the various types of motor carriages driven by steam, gasoline and electricity. This is probably the best comprehensive treatise published in simple language, so that the contents may be readily understood by the intelligent reader, especially if he has a machine to which he can refer for demonstration of many points discussed. For one who desires to understand automobiles, it is an excellent work to begin with before going deeper into the subject along highly specialized lines.

Size 5 1-2 x 8 1-2. Pages, 662

With Drawings and Half-Tones
Cloth bound \$2.00

The Class Journal Co.

231-241 W. 39th St., New York

**Automobile Catechism**

For the Use of Owners and Drivers
of Cars Fitted with Internal Combustion Motors

By

FORREST R. JONES, M.E.

President of the Manhattan Automobile School

Size, 4 1/2 x 7 inches. Pages, 134.
With Drawings.

Price, in genuine Morocco Cover, gilt edges,
\$2.00, including postage.

Order from the publishers

The Class Journal Co.

231-241 W. 39th St., New York



The Automobile Catechism is the most practical, up-to-date work on the subject in the English language. It is published in pocketbook form, with high-grade leather cover, and printed on especially tough paper, as it is intended to be the inseparable companion of the autoist when on tour. Not a line is wasted on obsolete constructions or descriptions of unfamiliar apparatus. It treats of the automobile in modern form and of all the troubles that may arise in the course of ordinary use and that may be remedied by the driver himself. It is written in plain language and is the most helpful, authoritative, and comprehensive manual that has yet appeared. The subject matter is in the form of question and answer, and an exhaustive cross index makes immediate reference possible in any particular case.

**Gas Engine Manual**

This volume just published gives the latest and most helpful information respecting the construction, care, and management of Gas, Gasoline, and Oil Engines, Marine Motors and Automobile Engines, including chapters on Producer Gas Plants and the Alcohol Motor.

Each chapter is illustrated by diagrams which make it a thoroughly helpful volume, containing 512 pages, 156 drawings, printed in large clear type on fine paper, handsomely bound in rich red cloth, with gold top and title, measuring 5 1-2 x 8 1-2 inches and weighing over two pounds.

The book is a practical educator from cover to cover and is worth many times the price to any one using a gas engine of any type or size. Price, \$2.00 Postpaid.

Send all orders to

The Class Journal Co.

231-241 W. 39th St. New York

The Automobile Business in all its Phases

Krausz's ABC of Motoring

Presenting the information in a fascinating, concise, and comprehensive manner. Different types of automobiles lucidly described, the anatomy of the gasoline mechanism clearly explained, and chapters on the care of the automobile, the art of driving, automobile etiquette, and troubles of the road, etc., etc. Instructive, Convenient, Reliable, Racing Statistics, Rules of Associations, Frontier Regulations, Speed Tables, Automobile Laws of the States, and numerous other matters important to the autoist.

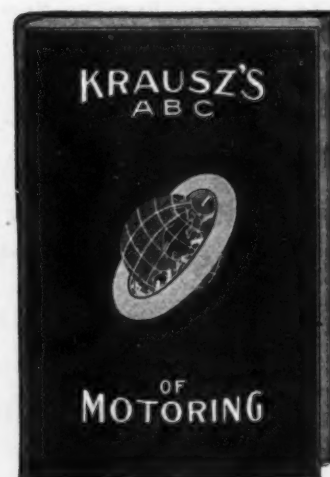
Preface by the President of the American Automobile Association. The endorsement by Mr. John Parson is a guarantee that the work is up-to-date and of practical value to all automobilists.

Leather Binding, \$2.00

Send all orders to

The Class Journal Co.

231-241 W. 39th St. New York





COLT'S AUTOMOBILE JACK

Ask for Catalogue No. 151.

BATAVIA CLAMP CO.
47 Center St., BATAVIA, N. Y.

A Year-Round Necessity

Ice, sleet and snow on the asphalt or country road make

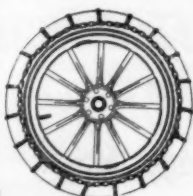
WEED CHAINS

even more necessary to the careful motorist in Winter than at any other season.

But Summer or Winter, Spring or Fall, Weeds on your tires positively prevent skidding. They afford traction, making it possible to negotiate any road.

Write for Bulletin.

WEED CHAIN TIRE GRIP COMPANY
27 MOORE STREET, NEW YORK



THE ECHO HORN FOR GASOLINE AND STEAM CARS

THE ECHO HORN CO., Dept. "A," 5801 Carnegie Ave., CLEVELAND, OHIO.
Factory Sales Corporation, Western Distributors, Chicago, Ill.



Dealers BUY BLACK DIAMOND Auto Equipments and Supplies

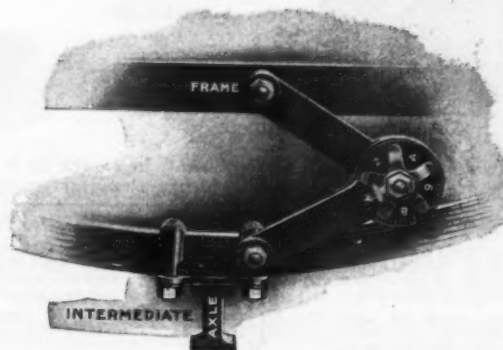
HAVE YOU OUR CATALOG ?

Time and Money Saved
Automobile Supply Dep't The Baum Iron Company
1220 HARNEY STREET, OMAHA, NEB.

**WE CAN PROVE YOU NEED A
SET OF SHOCK ABSORBERS**
—Then, of course, it will be
the

TRUFFAULT-HARTFORD

"The Standard of the World"



Automatically Lubricated, They Require No Attention

EVERY great speed contest, both in America and Europe, has been won by cars equipped with Truffault-Hartford Shock Absorbers.

For touring, they are a necessity—prevent the breaking of springs, prolong the life of tires and save YOU from the jars of rough roads.

Over twenty Automobile Manufacturers use them as standard equipment. Why? Because they know that their cars will give better satisfaction—ride more comfortably. That's the best proof we know that you need them too.

Order a set now—make your winter motoring a pleasure. A postal will bring full particulars. State make, model and year of car and let us advise you.

STANDARD, for cars over 1,800 lbs. (per set of four) . . . \$40.00
INTERMEDIATE, for cars of 1,200-1,800 (per set of four) . . . 40.00
JUNIOR, for smaller cars and Runabouts, weighing up to 1,200 lbs. (per set of four) . . . 25.00

HARTFORD SUSPENSION COMPANY

140 Bay Street, Jersey City, N. J.

Branches: NEW YORK, 212-214 W. 88th Street
BOSTON, 319 Columbus Avenue

NEW DOVER TOURIST OIL and GASOLINE KIT

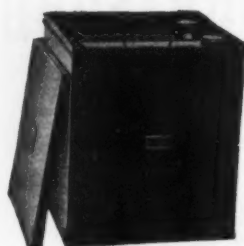
A Neat, Compact and Dust Proof Device for carrying
extra Oil and Gasoline when touring

INSTANTLY ATTACHED AND INSTANTLY DETACHED

Patent Applied For

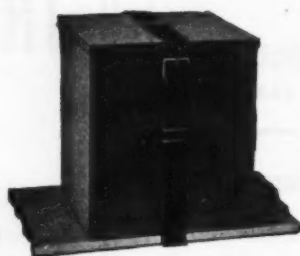
Furnished with Strap
complete,
Prepaid, \$4.00

FOR SALE BY
ALL DEALERS



Opened

No. 1
9 in. x 9 in. x 10 1/4 in. high
3 1/4 gals. capacity



Attached to Running Board

This fulfills a much needed want, inasmuch as it enables the auto tourist to carry a sufficient amount of his own brand of oil for an extended tour, in a very compact and convenient form, and will pay for itself in a very short time

It consists of a fine black enamel steel case, similar in appearance to a steel tool box, which may be instantly strapped to the running board. It contains inside two special enamelled cans (9 in. x 4 1/4 in. x 9 1/4 in.) having a capacity of over 1 1/2 gallons each, with special pouring spout and filler cap.

One may be used for oil and the other for a reserve supply of gasoline, or both for oil, or one can only may be used and the space occupied by other can used as storage room.

DOVER STAMPING & MFG. CO., Cambridge, Mass.

Victor
wears
three times
as long
as
any other
device



The
tension
spring
keeps
it
always
snug

COURT REFUSES

to grant injunction applied for by Weed Chain Grip
Company to restrain manufacture, use and sale of

VICTOR ANTI-SKIDS

Opinion by Judge Hale, of the United States Circuit
Court, District of New Hampshire, dated Oct. 22, 1908.

Long, hard usage has demonstrated that "VICTOR ANTI-SKIDS" are the best in the world. They have smooth, round spring rollers which cannot cut the tire and cannot skid—they wear three times as long as any other—they are always snug on the tire—absolutely silent and cannot rattle or slash the mud guards. All others wear sharp on the edges and cut and dig the tire. The revolving "Victor" roller always remains round. THE LATEST IMPROVED "VICTOR ANTI-SKIDS" ARE BETTER THAN EVER. They have defeated all other anti-skids in the fight for commercial supremacy. "VICTOR ANTI-SKIDS" will always win both before the public and before the courts. Manufactured by

VICTOR TIRE TRACTION COMPANY
NASHUA, NEW HAMPSHIRE

Excelsior Supply Co., Western
Distributors, Chicago, Ill.

W. J. Connell, New England
Sales Agent, Boston, Mass.

BARRETT AUTO JACKS

"The Jack that Duff Builds"
The buyer will never have cause to complain and the seller will gain the buyer's confidence when a Barret Jack changes hands.
THE DUFF MANUFACTURING COMPANY
Exclusive makers of "Barrett" Jacks
Works: Allegheny, Pa. Pittsburgh, Pa.
26 Cortlandt St., New York
4 Rue Auber, Paris 124 Longacre, London
Antwerp Montreal

Stevens-Britton-Maurel Co.

AUTO ACCESSORIES
MANUFACTURERS' AGENTS

1783 Broadway, N. Y. Tel. 6105 Col.

UNVARYING QUALITY.

Quality so high, that

"GLOBE" METAL POLISH

"It stays bright"

is the first selection, wherever polish is used

Sold by the best dealers in every city
RAIMES & CO. Ferry St., N. Y. City

THE PERFECTION WRENCH

The newest and best wrench made. All steel. Great strength. Instantly adjusted. Easily and quickly operated. Positive grip. Immense time, trouble and temper saver. Indispensable to automobilists. Best "all round" tool ever offered for sale. Must be seen to be appreciated. "You'll want one when you see it."

For circular address
THE PERFECTION WRENCH CO.,
Box 476, Port Chester, N. Y.

AUTOMOBILISTS

KNOW EXACTLY
HOW FAR AND HOW FAST

Attach a Warner Auto Meter to the dash of your car. Its record is infallible in any weather—on any roads. Write for detail.

Warner Instrument Co.
336 WHEELER AVE. BELOIT, WIS

Construction of a Gasoline Motor Vehicle

By C. C. BRAMWELL. Contains 250 pages 6x9; one hundred illustrations and diagrams. Publisher's price, \$2.00; our price, 50 cents. Address The Automobile, 231-241 W. 39th St., New York.

A. B. C. OF MOTORING

By SIGMUND KRAUSZ

A MANUAL of practical information for layman, auto novice and motorist, containing dictionary of terms, types of cars, anatomy of the automobile, motors, carburetor, ignition, cooling, tires, transmission, etc. Care of the machine, art of driving, troubles of the road, etiquette of automobilism, racing rules and statistics, foreign travel, clubs, manufacturers, trade papers, speed tables, and complete digest of motoring laws of thirty-five States and names of those having no laws.

Morocco Cover : : : : Two Dollars
The CLASS JOURNAL COMPANY
231-241 West 39th Street, New York

**METAL POLISH**

Highest Award
Chicago World's Fair 1893.
Louisiana Purchase Ex-
position, St. Louis, Mo.,
1904.

3-oz. Box for 10 cents.
Sold by Agents and Deal-
ers all over the world. Ask
or write for FREE samples

5-lb. Pails, \$1.00.
GEO. W. HOFFMAN
Expert Polish Maker
Indianapolis, Indiana.

Sold by Dealers.
New York City Office,
13 Park Row.

The Nightingale Whistle

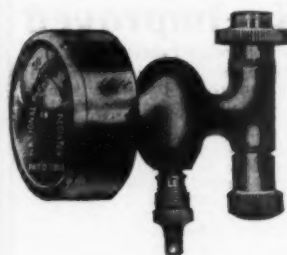
IS KNOWN BY THAT NAME ONLY

A canary bird's trill is
a whisper in comparison

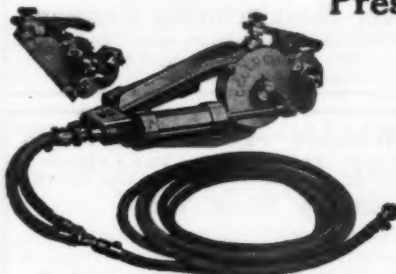
1693 BROADWAY, NEW YORK

The Complete Motorist

No theory, but all about an automobile—
its history; its mechanism and how to
select and run it. By A. B. FILSON
YOUNG. 328 pages, profusely illustrated.
Bound in cloth. Price, \$3.00. Address:
The Automobile, 231-241 West 39th Street,
New York.



National
Pressure Register



Kellogg Engine Driven Power Pump

Wray Pump**Register Co.**

ROCHESTER, N. Y.

Makers of Tire Pumps
and
Pressure Registers

When writing about
the Kellogg Detach-
able Engine Driven
Pump, give name of
car, year made, and
if it has an exposed
shaft on the engine
give diameter.



Kellogg
4 Pump

**NARROW JAW WRENCH "TRIMO SPECIAL"**

INVALUABLE FOR "AUTO KITS"

THIS WRENCH is designed for close work. Insertible, interchangeable jaws prolong
life of this wrench indefinitely. The jaws are narrowed materially, and can be
used in close-quarter places. Made in 10-inch only.

It is light in weight, and particularly designed for Automobile use. No Auto outfit
complete without this tool. Write for Catalog No. 70.

TRIMONT MANUFACTURING COMPANY, Roxbury, Mass.

**A. B. C. OF
MOTORING**

By SIGMUND KRAUSZ

A MANUAL of practical information for
layman, auto novice and motorist, con-
taining dictionary of terms, types of cars,
anatomy of the automobile, motors, car-
buretor, ignition, cooling, tires, transmission,
etc. Care of the machine, art of driving,
troubles of the road, etiquette of automo-
biling, racing rules and statistics, foreign
travel, clubs, manufacturers, trade papers,
speed tables, and complete digest of motoring
laws of thirty-five States and names of
those having no laws.

Morocco Cover : : : Two Dollars

The CLASS JOURNAL COMPANY
231-241 West 39th Street, New York

**THE
GAS ENGINE
HANDBOOK**

By E. W. ROBERTS, M. E.

A VERY useful manual of information
about American practice in the con-
struction and operation of stationary gas en-
gines, for the use of the designer and engi-
neer. Very little space is wasted on past
history, for the book is of and for to-day.
It contains many useful tables and formulas
and a number of helpful drawings illustrate
the text. Size, 3 1/2 by 5 1/4. Pages, 264.

Flexible Covers One Dollar Fifty

The CLASS JOURNAL COMPANY
231-241 W. 39th Street, New York

1909 WINNER

The Latest

Most Practical

Reversible Movable Ratchet

Two
Sizes



Universal Steel Handle

All
Stores

Descriptive Circular and Cuts for 1909 Catalogue Free

TUDOR MFG. CO., Taunton, Mass., U. S. A.

THE 1908 PEERLESS JACK—Improved

United States and Foreign Patents Granted.
Made of Malleable Iron. Is strong, compact, light, rapid, cheap and by far the most popular Automobile Jack on the market. The leverage is much easier than on our former makes of these jacks. The handle is 15 inches long and shaped to make one of the best tire tools on the market. It can also be used as a hammer. The handle socket is curved, enabling the jack to be worked under any car, and it is not necessary to get under the car to operate it. Works at any angle; can be used for pushing as well as lifting. It is automatic—working the handle below the level lowers or turn handle over and work below level. Nothing easier, nothing simpler. Specify Peerless Jacks for your cars.

Oliver Manufacturing Company
200 South Desplaines St., Chicago.
See our exhibits at both New York Shows, also Chicago and Boston Shows.

EXPANDED METAL LOCKERS

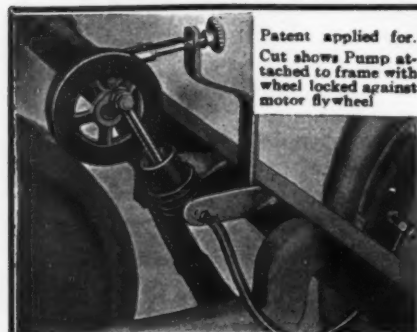
Sheet Steel Material Closets

MERRITT & CO.

45 ARCH STREET CAMDEN, N. J.



STANDARD
(Trade Mark)
SPEEDOMETER
Accuracy and durability guaranteed. Hand is absolutely steady at all speeds.
40, 60, 80-mile instruments.
Send for catalogue and prices. Agents wanted.
PARKER MFG. CO., 8
Clifton St. Boston, Mass.



Patent applied for.
Cut shows Pump attached to frame with wheel locked against motor flywheel

EBERMAN AUTO-POWER TIRE PUMP

The Engine Does the Work

Happy New Year

Yes, indeed, and with the heartiest good-will to the motorist who recognizes the value of the Eberman pump and specifies it on his 1909 car.

See next week's and last week's issue for further points.
Model A, \$15 Model B, \$20
EBERMAN AUTO APPLIANCE CO., (Not Inc.)
HARRY H. REYNOLDS, Manufacturer's Sales Agent
1205 Monadnock Block, Chicago
Eastern Sales Agents: Stevens & Britton, 1773 Broadway, N. Y.

The Practical Gas Engineer

What It Is and How To Do It. A book of 150 pages neatly bound in cloth. Sent postpaid for \$1. Address Book Department, The Automobile, 231-241 W. 39th St., New York.

Induction Coils

Gives easily understood explanations of the operation of coils. Of great value to the autoist. By H. S. NORRIE. 265 pages. Numerous illustrations. Cloth bound. Price, \$1.00. Address The Automobile, 231-241 West 39th St., New York.

**DECARBONIZER**

chemically removes carbon from cylinders, piston valves and rings. INCREASES POWER 20 per cent. Volatilizes carbon, in which form it passes out exhaust. Injury to metal work impossible. Agents wanted in certain localities. Write to-day for particulars.

General Accumulator & Battery Co.
150 Second St., Milwaukee, Wis.

SAFETY TANK GAUGE

Price, \$2.50

Old way—Measure your gasoline with dirty stick. New way—Measure your gasoline in tank with the New Safety Tank Gauge. Positive in action.

**VOLTA "CLOCK"**

Sent to any address prepaid on receipt of price.

Price, each \$4.00

This clock is the neatest, most inconspicuous Motor Clock on the market and is a thoroughly reliable time-piece. It is made up of a high-grade Swiss watch encased in a solid case, water and dust proof. The off-set casing is highly finished and an attractive ornament to any dashboard or the inside of any Limousine. This "VOLTA" is the best value for the money on the market to-day. Can be had in brass, bronze or nickel. Guaranteed for one year.

New England Auto Sales Co.

1024 Boylston Street

Boston, Mass.

SELF-PROPELLED VEHICLES

By J. E. HOMANS, A. M.

IT'S a new book and tells the whole story. It explains in simple, non-technical language the mechanism and management of every type of automobile. 640 pages; 500 illustrations; complete diagrams; ready reference index.

PRICE, TWO DOLLARS

ADDRESS BOOK DEPARTMENT
The CLASS JOURNAL COMPANY
231-241 West 39th Street, New York

AUTOMOBILE CATECHISM

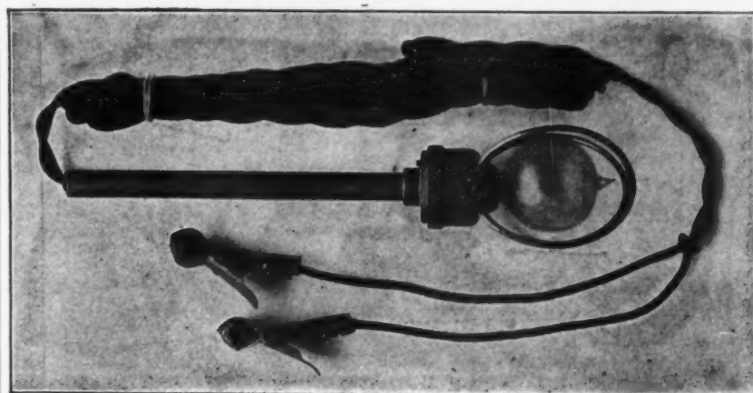
For the Use of Owners and Drivers of Cars Fitted with Internal Combustion Motors

By FORREST R. JONES, M.E.

President of the Manhattan Automobile School

THIS is the most practical, up-to-date work on the subject in the English language. It is published in pocketbook form, with high-grade leather cover, and printed on especially tough paper, as it is intended to be the inseparable companion of the autoist when on tour. Size, 4½x7 inches. Pages, 134. With drawings.

PRICE, IN GENUINE MOROCCO COVER, GILT EDGES, \$2.00, Including Postage
The CLASS JOURNAL COMPANY
231-241 West 39th Street, New York



SPECIAL PRICE DURING SHOW
AUTO TROUBLE LAMP

This lamp is an invaluable aid to the Automobile or Boat man. Can be used on either storage or dry cell ignition battery.

WILL ALWAYS WORK

No special Battery required. No Change of Connection, as our patent clip is instantly attached to binding posts of battery. It is much better than the average battery tester to tell when your battery is getting weak.

Seven feet of flexible cord, 4 or 6 volt, 4 candle power lamp, with patent clips.

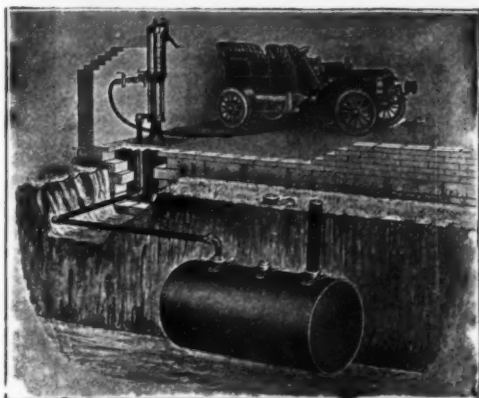
MANUFACTURED BY

D. G. FOX

85 Washington St. Haverhill, Mass.

SPECIAL PRICE, COMPLETE, \$1, prepaid on receipt of price.

Patent Pending.



Cut 41—Long Distance Outfit. The Standard Garage Equipment for Gasolene Storage.

Better Gasolene for Less Money

If you could run your car farther with less gasolene, and pay less for what gasolene you do use, wouldn't you do it?

This may sound impossible, but it is easily done. Just get a

BOWSER GASOLENE TANK

The Bowser enables you to safely store gasolene in large quantities so you can pay wholesale prices.

Then, the Bowser keeps the gasolene for you just as strong and powerful as when it left the refinery, giving you more power per gallon than gasolene stored any other way.

Aren't these points worth looking into?

Send a postal for catalog J. It is full of automobile pointers.

S. F. BOWSER & CO., Inc., Fort Wayne, Ind.

255 Atlantic Ave.,
Boston

50 Church St.,
New York

Fisher Bldg.,
Chicago

612 Howard St.,
San Francisco

66-68 Fraser Ave.,
Toronto



PERFECTION SKID PROOF CLIMBERS

Take a Good Look

at the device, the heavy chain and the smooth, round contact faces of the cross members. Don't they look good to you? Better than the ordinary flimsy affairs that wear sharp and cut the tire or wear it all away by their constant scratching and scraping.



Neat in Appearance, Durable and Reliable in Use. Are years ahead of anything else of the kind on the market. When you buy get the **BEST**. They will outwear any three of other kinds and you will not have to keep patching them up all the time, either. Write today for particulars, etc.

Perfection Non-Skid Climber Co., Fdon, O.

The HYDRO-PNEUMATIC SPRING is THE THING

Just

Stop and Think

Will smooth down the roughest roads

Our Springs in connection with solid tires will make your car ride easier than with pneumatics, and consequently save all tire troubles and expenses, and eliminate all dangers connected with pneumatics. **Guaranteed air tight forever.**

For full information ask for booklets A and B

TROJAN HYDRO-PNEUMATIC WHEEL CO. (Inc)
 WATERVLIET, NEW YORK





BE A WINNER IN 1909

Let the public know about your products in a manner that attracts them. Of the whole heap of advertising matter printed a great percentage is **money thrown away**, because it did not attract attention. If there had been a little more money put with what was invested to make it a sure go, two dollars would have saved twenty.

The result of your advertising campaign is almost solely dependent upon your cuts—the engravings you use can **add 100 per cent. to the attractiveness of your printed matter.**

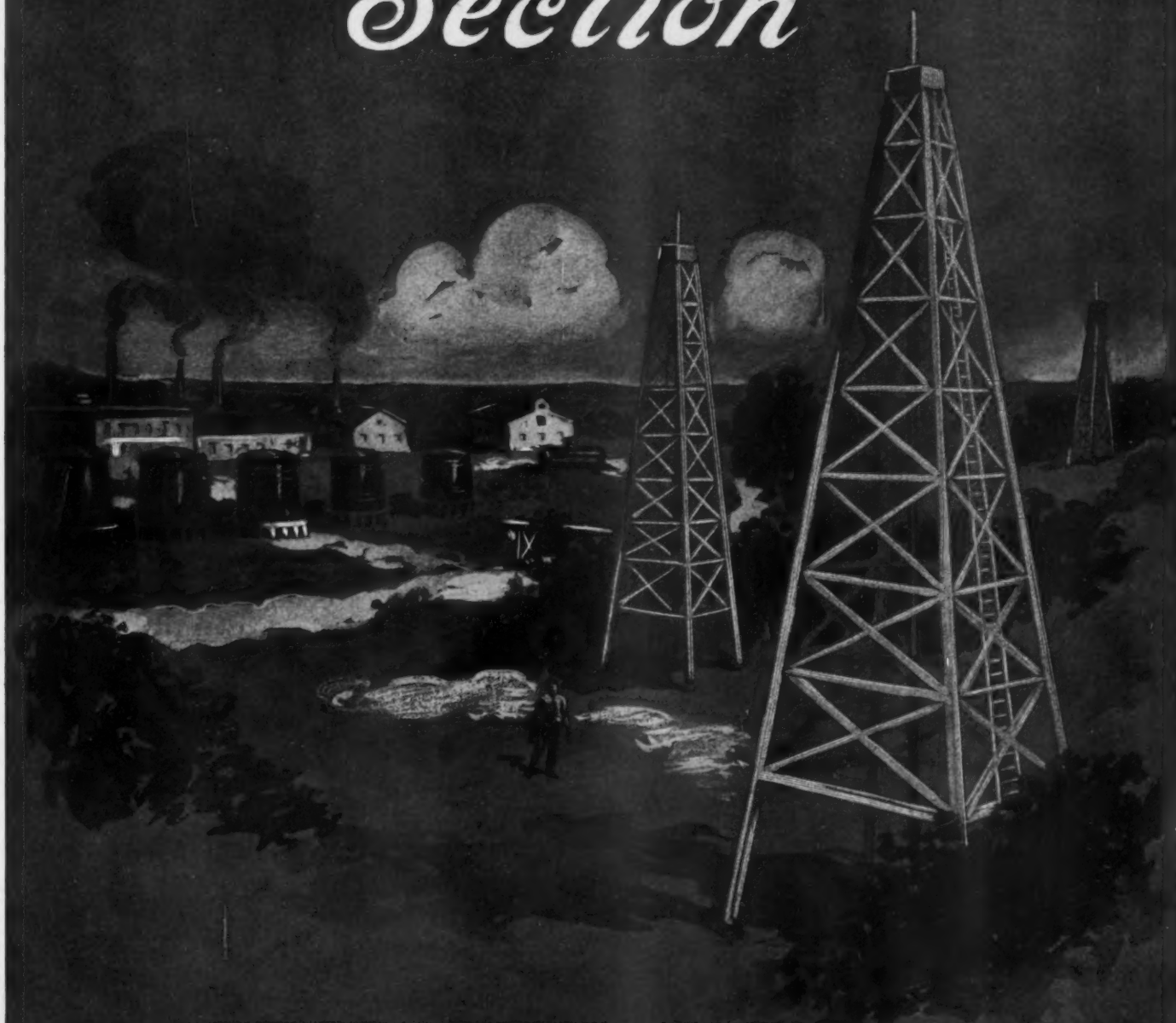
We have been manufacturing engravings since 1871, and in soliciting your business are placing at your disposal the knowledge and experience of years, together with the progressive and present-time methods of the leading engraving house in the United States. We operate a modernly equipped plant. We employ the most skilled workmen. We use only the highest grade materials. Our prices are consistent with quality, and our service is prompt. We will make you cuts better than you get elsewhere—cuts that are imbued with that indescribable something that puts **life, snap and go** into the subject illustrated, and that will aid materially in selling your product. Your order, whether for \$1 or \$1,000, will be the subject of especial care, and you will be furnished as perfect engravings as can be produced for letter-press printing. Your work can be handled just as intelligently by mail, as if we were in your own office talking the matter over. Send us your orders—let us demonstrate in a practical way we are all we claim.

MOSS

PHOTO-ENGRAVING COMPANY

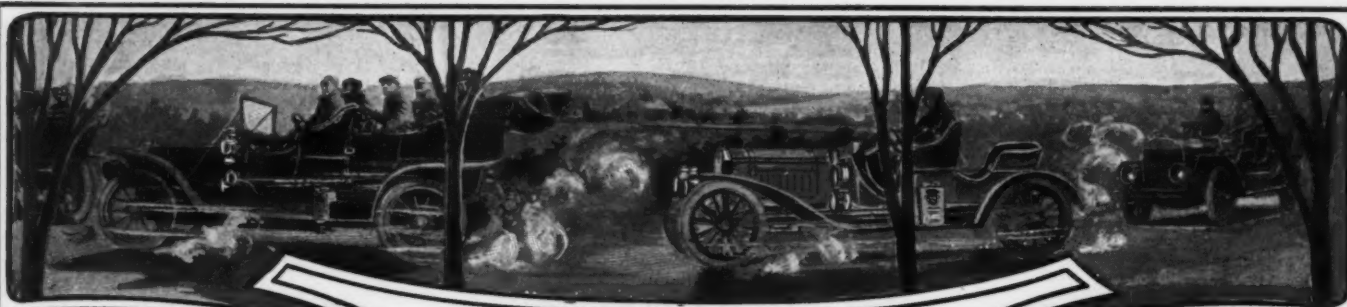
295-309 Lafayette Street, cor. Houston ("Puck" Building)
NEW YORK

Lubricating Section



INCLUDING

Lubricators, Pumps, Tanks, and Lubricants, as Oils,
Greases, and Graphite.



USE

KEEP UP WITH THE
PROCESSION*START THE NEW YEAR
RIGHT***Oilzum**FOR ALL MAKES
OF MOTOR CARS

IT

LUBRICATES

IS GUARANTEED TO KEEP
PLUGS, VALVES, PISTONS
AND
CYLINDER WALLS CLEAN

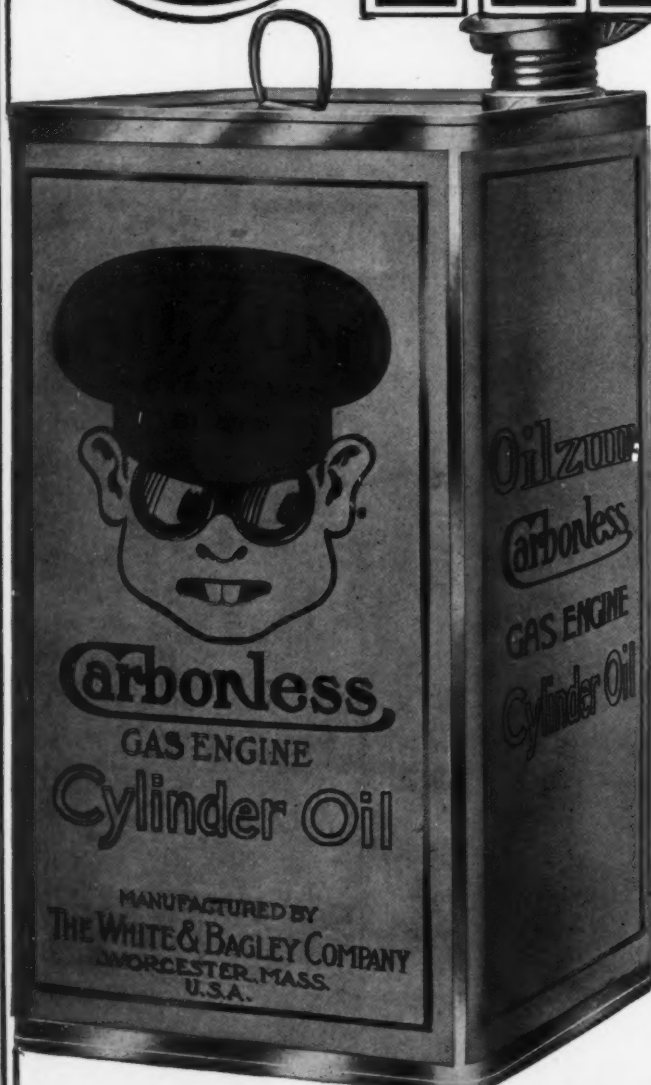
INCREASES

POWER

BEST BY EVERY TEST

MADE AND SOLD
IN CANS, BARRELS
AND CARLOAD LOTS

BY

THE
WHITE & BAGLEY Co.
WORCESTER, MASS.
U. S. A.WE ARE GIVING AWAY SOMETHING USEFUL FOR
YOUR CAR. IF YOU WANT ONE, SEND THIS COUPON

SEND THIS



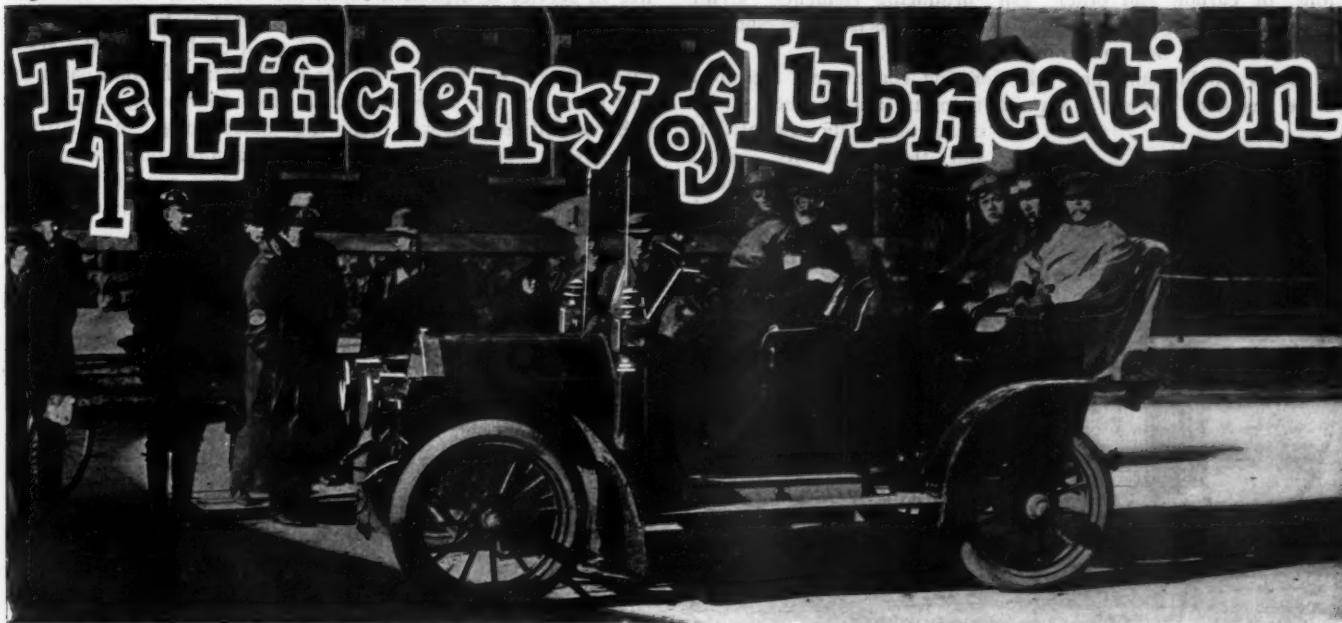
su
do
wa
of
in
to
pl
th
sq
fo

co
ca

be
tio
th
to
sp
th
is
go

re
to
sn
Th
ag
"su
con
fre
the
the
a d
to
Gr
sys

—
tan
of
lub
the
oil
use
tem



If the thickness of an oil film is one thousandth of an inch, a single drop of oil will cover about two square inches of surface. This drop of oil will, while it stays on the surface, do all that can be done by way of affording the slippery surface wanted, and prevent the metals from contacting. No quantity of oil can do more, and good oiling facilities consist essentially in the device that will replace that drop of oil when it ceases to extend the unctuousness desired or if it is squeezed out of place. On this basis, a cubic inch of oil will lubricate over a thousand square inches of surface, or replenish the supply on a square inch of motor bearing surface once for each revolution for a minute of time.

Lubricating products are valuable on two accounts, *i.e.*, the cost of good lubricants is high, and the cost of repairs, if lubricants are not good, is higher.

Splash Systems of Lubrication.—There is nothing much to be said in favor of the old-fashioned splash systems of lubrication, but the modern splash system is not the crude proposition that those who do not keep abreast of the times would seem to think. In the modern system the connecting rod does not splash the oil at all; on the other hand, a little scoop dips into the trough of oil and scoops up a small quantity. The trough is kept full by a single circulating (gear) pump, and the overflow goes to the "sump"; in other words, the well.

The Force Feed System.—This is the system that positively replaces "the drop of oil" as it wears away under the pressure to which it is subjected. This system consists essentially of snap piston (plunger) pumps, as many as there are places to oil. The pistons are drawn back against the spring, and when the "suction" or "flooding" stroke is completed the plunger is cast free, and under the impetus of the stored energy in the spring the plunger snaps back, forcing a definite measure of oil directly to the surface to be lubricated. Great reliance is placed on this system, and it is much used.

Feeding Oil Under Pressure.

—In this system an oil container is connected by a system of piping to the bearings to be lubricated. Pressure is put on the container and the flow of oil is regulated. If good oil is used—and it should be—the system works.

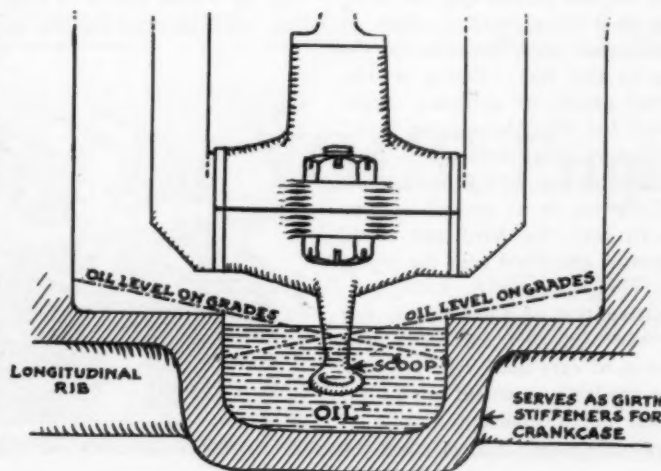
Vacuum System of Lubrication.—In this system the oil is held in a chamber adjacent to the crankcase, and by a system of piping a balance is so maintained that atmosphere is admitted as oil flows out. The oil chamber is held at a partial vacuum. As in the pressure system, if good oil is used, the system is not likely to clog up.

Feeding Solid Lubricants, Grease, Etc.—Solid lubricants are placed directly in the transmission case, wheel hub caps, timer cavity, and universal joint housings. The small bearings are provided with grease cups. In some cases the solid lubricants are fed through a system of piping, under pressure.

Characteristics of Lubricants.—Unctuousness is the prime property. If the oil will not afford a slippery surface, it is of no value, unless to act as a "dog in the manger" while the bearings heat up and "freeze." Anything in the oil that supplants unctuousness is detrimental, since it displaces the very property for which oil is used primarily; soapstone, chalk, talcum, or any other (so-called) body maker is, therefore, an adulterant that can have no honest place in a lubricating medium. Body, next to unctuousness, is of importance, since oil has a duty to perform aside from furnishing a slippery surface. The metals must not be allowed to come into contact with each other, and the requisite body must be there to enable the oil to sustain the pressure. Mobility is also a property that should be well regulated, in view of the arduousness of the service, and, too, the mobility should be constant. If the oil lacks mobility it will flow sluggishly, and may not be able to flow freely into the surfaces to be lubricated. Mobility should not be much affected by temperature changes.

Acidity in lubricants is the bane that leads to grief. The costly ball and roller bearings are ruined by acids, and in plain bearings the polished surfaces of the spindles and journals are ruined. Acidity may be due to a faulty process, or it may be the product of reaction in the materials used. Heat and light in the presence of atmosphere seem to be all that is necessary to render the average "animal fat" acid in its reaction within a short while after it is compounded.

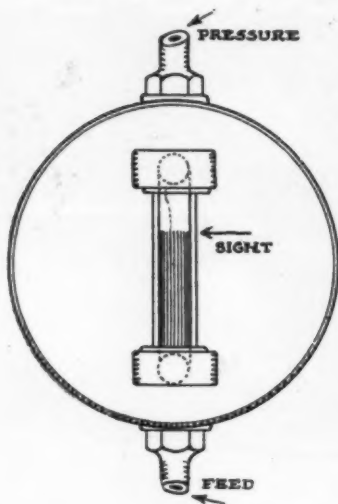
A residue after combustion is very undesirable; nor does it matter if the residue is carbon



Modern Method of Controlling Splash Feed.

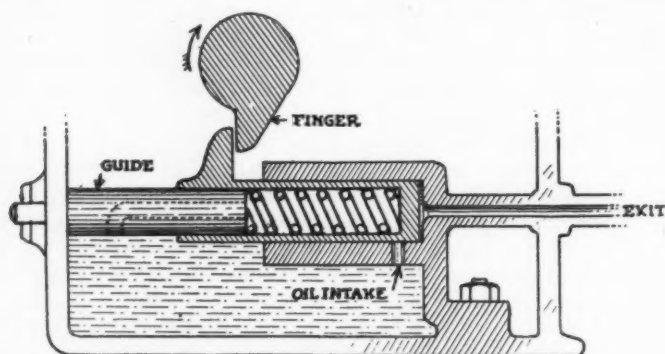
alone, or carbon and other "ash" producing elements. Cylinder oil is ultimately burned, and the products of combustion should be gases, not solid non-combustibles.

Jelly is troublesome, and jelly-forming constituents are much to be avoided. What is wanted, then, are unctuousness to the maximum, body regulated to suit the conditions, and a constant mobility unaffected by temperature. Solid lubricants should only differ in body; they should not lack in unctuousness, nor should they change mobility under temperature changes. What we do not want are acidity and residue. Pure mineral lubricants seem to be the right products in automobile work, and, fortunately, there are producers, of honesty and skill, catering to the automobile trade, who have made a study of the automobile, and who fully realize the desires and the reasons.



Customary Pressure System.

It is to be hoped that lubricants will not be rendered acid by the addition of substances of an acid reaction, in order to impart a sweet-scented odor. Autoists do not use lubricants as pomade. It is equally objectionable to reduce the degree of unctuousness by any clarifying process whatsoever. A good lubricant with a bad color is superior to any of the "aesthetic blends," in which the value of the qualities for lubrication may be a diminished quantity. The automobiles of to-day are less noisy and lower in cost of maintenance because grease cups are



Section of a Conventional Force Feed System.

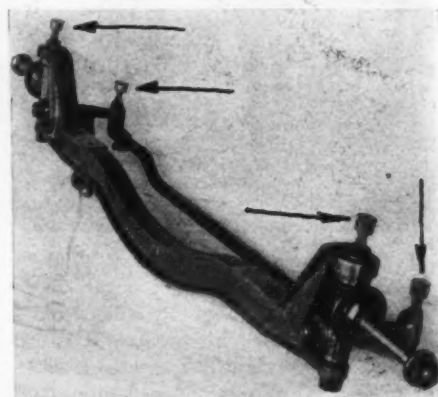
used in great profusion where once a hole was drilled and dirt was free to enter, there to mix with an occasional drop of oil, to make abrasions that soon increased the lost motion and the rattle.

Oil Piping and Fittings.—The need for a sturdy system of piping has been felt keenly in the past, and, fortunately, the builders of automobiles are alive to this fact. Piping is now more stable, and, besides the better grades of annealed copper tubing, there seems to be a demand for "flexible metallic hose." This product is easy to install, remains tight, and is free from breakages in service. Valves and fittings are with ground joints and are stable in maintenance. Graphite, in its several aspects, is widely used in connection with both the hard and liquid lubricants. With graphite care must be exercised with the piping to prevent clogging.

Influence of Good Oil on Maintenance of Cars.—It is not certain that this phase of the subject was so very well understood by even the builders of cars until very recently. At all events, taking the evidence available, it would not be far from wrong to say that there was not a sufficient display of oiling devices on cars until it was adequately proven that the

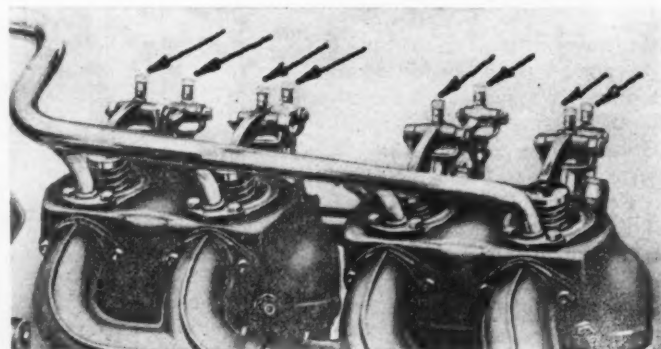
life in service is dependent upon the care with which the oiling is done. This does not mean that a crankcase full of oil will do all there is to be done. A body of good oil laying in the crankcase will scarcely serve to oil the multiplicity of small parts that will soon cry for lubrication in a most distressing way, and if it be denied the car will reach the "noise" stage long before it is ready to "scrap," unless it is true that noise alone is sufficient cause for not wanting a car. A little grease cup on the dozen-and-one small bearings that cannot be oiled in any other way will do a world of good, and the builders of cars now recognize this fact. Users of these same cars will do well to note the fact, and they will be wise if they regard the grease cups in the light of utility devices of a high degree.

It would not be too much to say that a grease cup on a shaft or a spring, as the case may be, will do more to prevent rattle



Characteristic Use of Grease Cups.

as much good as no oil. True, there may be a chance of putting off the evil day, but not for long. The one sure way to avoid any trouble at all is to see to it that the oil is not only good, but that it reaches the spot. The builders of cars of the kind that an autoist of experience will be likely to choose have done their part when they provided the devices and protection from "grit." It must be understood that protection from "grit" of the road depends upon profuse oiling, as well as upon such mechanical protection as ingenuity will evolve. The underlying principle is one in which oil going out assures that grit is not passing in. Chains, for illustration, if kept well lubricated, even if they are in actual contact with the dust of the road, will take care of themselves to a marvelous extent, contrary to a popular superstition. This, too, is for the reason that the oil on the surfaces will not allow the grit to get to them. As long as the grit is warded off the situation is healthy. A run of a century on a dry chain is likely to do more damage than ten such runs on a chain provided with enough oil to coat the surfaces. What is true of a chain is equally true of all the other parts of a car, and it is not assured that autoists fully understand this important matter. If they do, it is also important to look out for impure lubricants, such as animal grease in which acid abounds, or the compounds that will become rancid in time, which is not uncommon.



Illustrating the Application of Small Cups.

“A Supreme Test of Speed
and Endurance Is No
Time to Take Chances!”

That is Why the Winners of Great Motoring
Events Everywhere Use

MONOGRAM OIL

The FIRST THREE cars in the Vanderbilt Cup Race
of this year, the FIRST FIVE in the Grand Prize Race
at Savannah, Ga., and TWO OTHERS of nine to finish
that event, used MONOGRAM OIL and they had the
Speed, Endurance and Lack of Engine Trouble to win.

“Best for YOUR Engine”

Manufactured Solely by THE COLUMBIA LUBRICANTS COMPANY of New York
116 Broad Street

MONOGRAM OIL is sold at all garages



The Kokomo Magazine
Pneumatic GUN Automatic

(For Heaviest GREASE or Lightest Oil)

THIS Gun is designed for the use of those who want **THE BEST** and is not intended to compete with **The Make-Shift** guns in common use. It can be loaded and used at once or carried for an indefinite time, being **always** ready for use. It is **cleanly**. You need not **soil your hands**. It can be applied with one hand. You don't carry a dirty grease box. Don't ruin your machine because lubricating is dirty work; it can be done quickly and with **unsolled hands** with the **KOKOMO**. You push on the handle, it does the rest.

WRITE FOR CIRCULAR AND PRICE LIST

KOKOMO GREASE GUN CO. P. O. Box 134 **Kokomo, Indiana**

Labels in illustration: SCHRADER AIR VALVE, A, B, C, D, E, F, STEEL TUBING NICKED, BRASS CAP, VALVE REGULATOR, STEEL TUBING NICKED, BRASS CONE.



— USE —

“HAVOLINE”

OIL

“It makes a difference”

FOR AUTOMOBILES FOR MOTOR BOATS

HAVOLINE OIL COMPANY

Executive Offices: 80 Broad Street, New York City
Retail Store: 1906 Broadway, New York City

Boston: 749 Boylston Street

Chicago: 40 Dearborn Street

Pacific Coast Agents: W. P. Fuller & Co., San Francisco



And its application is for all seasons—hot or cold; it is a true lubricant and is not affected by atmospheric conditions. The power of the car is fully developed because no power is wasted in overcoming friction. It does seem as though you might make a trial of KEYSTONE GREASE; you are the one to be particularly benefited.

For Sale by all Auto Supply Houses and Garages, or direct from

Keystone Lubricating Co.
Philadelphia, Pa.

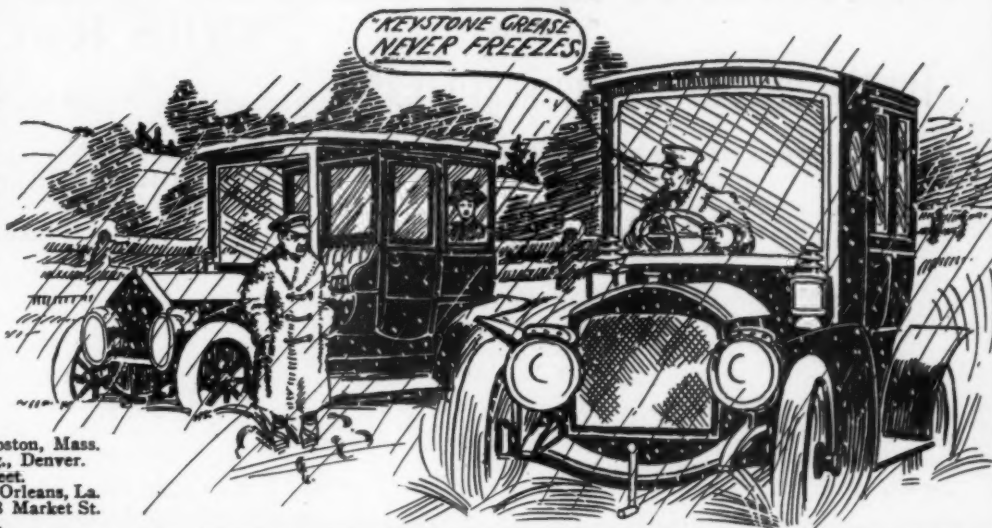
BRANCHES:

New England Office: 10 Oliver St., Boston, Mass.
Northwestern Office: 203 McPhee Bldg., Denver.
New York City Office: 96 Warren Street.
Southern Office: 610 Chartres St., New Orleans, La.
San Francisco Office & Warehouse: 268 Market St.
Chicago Office: 1210 Tacoma Building.

IF IT SUITS YOU TO CAMP OUT IN A SNOW STORM

in your car because of frozen lubrication, of course it's no business of ours; only most people don't particularly care for it. Our appeal is directed to those who have a desire to arrive. If there is one thing more than another that makes winter motoring a delusion and a snare, it is the matter of lubrication. Yet this need not be so; the remedy is at hand; all that is needed is the application. The remedy for all faulty automobile lubrication is

KEYSTONE GREASE THE WORLD'S GREATEST LUBRICANT



Here's the Stuff

Dixon's Motor Graphite helps compression in cylinders quiets noise in gears, makes smooth running throughout. Booklet 9 G tells

how to use it. Write for free copy.

JOSEPH DIXON CRUCIBLE CO.
JERSEY CITY, N. J.

Send for Catalog



Rotary Pumps

for Circulation of Water and Oil on Automobile, Marine or Stationary Engines, and for bilge purposes. All sizes and capacities.

THE LIPMAN CO.
210 Pleasant Street,
Detroit, Wis.

NON-FLUID OILS

Accept only the GENUINE with our Trademark and name.

N. Y. & N. J. LUBRICANT CO.
14 Church Street, New York City

USERS OF

Invader Oil

THE OIL THAT GRAPHITIZES

are responsible for its popularity



YOU NAME THE CAR WE'LL NAME THE GRADE

MADE ONLY BY
CHAS. F. KELLUM & CO.
113 Arch St., Philadelphia
BOSTON BRANCH:
284 Columbus Avenue

NOW ON SALE

AUTOMOBILE CATECHISM

For the Use of Owners and Drivers of Cars Fitted with Internal Combustion Motors

By

FORREST R. JONES, M.E.
President of the Manhattan Automobile School

Price in genuine Morocco Cover, gilt edges

\$2.00

Including postage

Order from the publishers

The Class Journal Company
231-241 West 39th St., New York City

The Automobile Handbook

A practical book for owners, operators, and mechanics. Includes road troubles, motor difficulties and other contingencies and how to handle them. By L. ELLIOTT BROOKS. 320 pages. Numerous illustrations. Full leather, limp. Price, \$1.50. Address The Automobile, 231-241 W. 39th Street, New York.

MILLER'S QUICK OPERATING GREASE GUN



Gun Filled and Emptied in 30 Seconds

MILLER & STARR

250 Greene Street - Brooklyn, N. Y.

AUTOMOBILE RECORD

By SIGMUND KRAUSZ

EXPENSE account for fifty-two weeks, with columns for cost of gasoline, carbide, kerosene, repairs, replacements, daily runs, chauffeur's salary, garage expenses, speed record, starting point, destination, motoring laws of thirty-five States and names of others having no laws. Totals of expenses and runs for any period shown at a glance.

MOROCCO COVER, ONE DOLLAR

The CLASS JOURNAL COMPANY
231-241 West 39th Street, New York

What Oil Do You Use? PANHARD OIL

"The oil in the checkerboard can"

has been on the market since 1903. Its quality is established. There is but one way to test an oil—try it in your car and watch results.

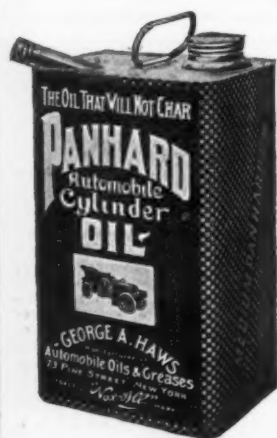
Panhard Oil Proves by Test, Not by Color, that It Is Free from Carbon

Perfect lubrication without carbonization increases the power of a motor. Imperfect lubrication results in loss of power, knocking and even scored cylinders and pistons.

The Lancia, which won at Savannah, used Panhard Oil. What better proof do you want than that, that it is the oil for you? **TO DEALERS**—Do you keep Panhard Oil? If you do, you know that you retain the permanent trade of every customer. If you do not, in fairness to your customers and to ourselves, say so.

Eventually you will handle Panhard Oil because the best is always the cheapest, and a satisfied customer is too valuable an asset to lose.

Send for our booklet "Lubrication." It is full of practical hints and gives a lot of useful information on cylinder oils.



The New Can

George A. Haws
76 Pine Street
New York

HARRIS TRADE MARK-REG. U. S. PAT. OFF. OILS

MADE FAMOUS
BY
1908 Racing Events

YOU MAY SEE THEM NEXT

AT
Madison Square Garden

Elevated Platform
Space No. 159

January 16 to 23

==PAY US A VISIT==

A. W. HARRIS OIL CO.
PROVIDENCE, R. I.

GRAPHLIO- GREASE

A perfect combination of a pure, low cold test Neatsfoot oil and Graphlio, the GRITLESS Graphite. There is nothing like it or equal to it in the world.

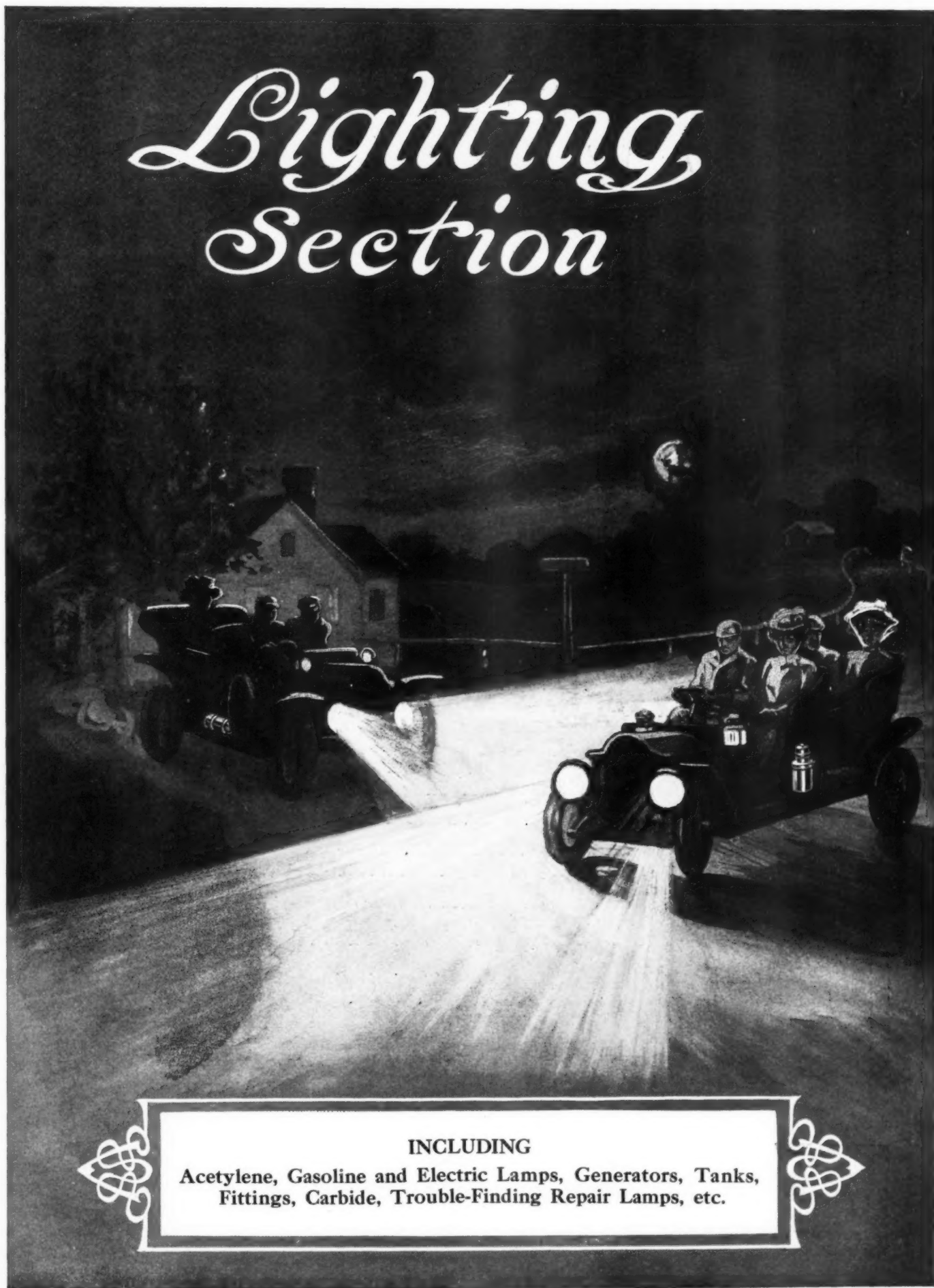
For Gear Case and Differential, we make it in both semi-liquid and very light grease consistencies.

Will stop the noise and make your machine run like a watch.

5 and 10 pound cans. Order from your supply man or us.

Walter D. Carpenter Co.
39 Cortlandt St., New York

Lighting Section



INCLUDING

Acetylene, Gasoline and Electric Lamps, Generators, Tanks,
Fittings, Carbide, Trouble-Finding Repair Lamps, etc.

The MOTORIST'S DREAM REALIZED !!!



AUTOGAS MAKES SAFE

The road ahead is as plain as day for the motorist when the car is equipped with AUTOGAS, the gas tank filled with a long distance supply of pure gas giving a never failing, strong, bright light at all times and under all conditions. The Pure Gas has no foreign matter to clog up the burners—nothing to freeze.

All genuine AUTOGAS tanks have the TRIANGLE name plate.

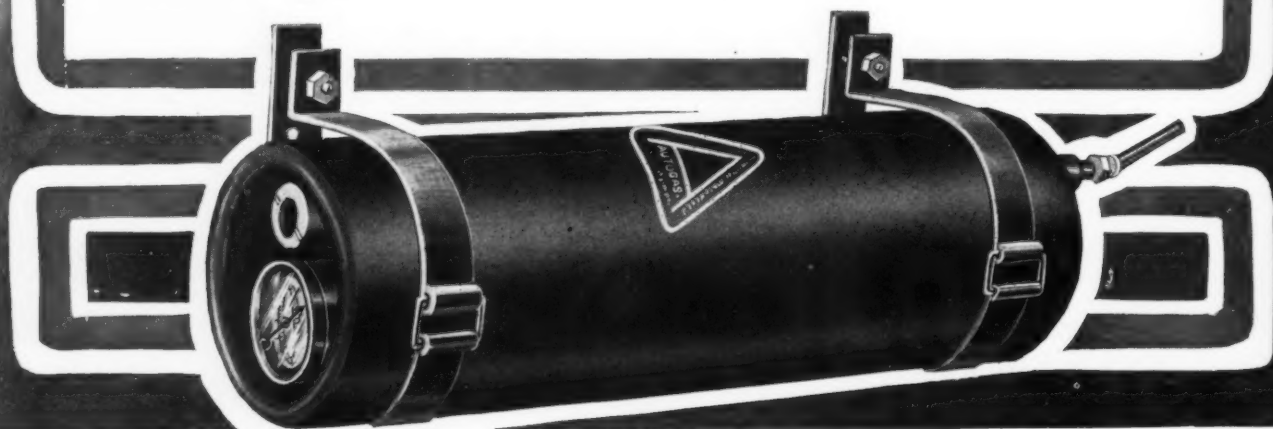
Look for the triangle and insist on AUTOGAS. BEWARE of inferior imitations and do not buy experiments when you can get genuine AUTOGAS and satisfaction.

FOR SALE BY LIVE DEALERS EVERYWHERE

AVERY PORTABLE LIGHTING CO.

MILWAUKEE, WIS., U. S. A.

NEW YORK: 243-245 W. 57th St. LOS ANGELES: 1200 So. Main St. CHICAGO: 1226 Michigan Ave.



li
av
tu
th

m
of
w
is
th
ar

in
siz
If
pr
inc
ur
ma

wa
(b
Th
the
wo
ad
tan
ven
acc
ma

an
ton
pos
the
bei
sta
acc
me
exa
like

M
diti
wat
the
The
thro
pou
calo
wat
ma
shal

S
to p
a v



THIS is a matter in relation to which it will be fair to say the equipment can scarcely be too good. In the early days lighting facilities were rather crude and the memory of the average autoist is a little raw when lighting is the subject. Fortunately the experience gained has been put to good account and the lighting equipment now to be had is up to a high standard.

Legal Requirements.—The oil sidelights and a tail-lamp must be used to conform to the law. These lamps are usually of such good value that they serve for lighting "about town" without having to utilize the gas system. The trend in oil lamps is toward more thorough work and greater security as against the loss of parts on the road. The brackets of die forged steel are more substantial than were the castings (bronze) of the past.

Great Variety in Gas Lamps.—The gas lamps to be had are in great variety and efficient in the extreme. The lenses are in sizes up to 12 inches, designed in divers ways to suit conditions. If a concentrated "beam" of light is wanted lamps are made to project the same, or, if a scattered illuminating effect is to be included, then, too, are lamps to be had. The efficiency, as measured in candlepower for a given acetylene consumption, is remarkably high.

Source of Gas Supply.—The gas supply is available in two ways, viz.: (a) from tanks of acetylene under some pressure; (b) from generators in which the calcium carbide is used direct. The acetylene tanks are of convenient size and the principle of the storage of the gas may be briefly stated as follows: Asbestos wool is put into the tanks and a measured quantity of acetone is added. The acetylene gas is thereafter communicated with the tanks and the quantity of acetylene that each tank will hold is very considerably increased because of the presence of the acetone, which has an affinity for acetylene. These tanks are made in various sizes and are in strong demand.

Considering the direct generators, they are in divers form and in sizes for every possible requirement. These generators are generally made in brass, avoiding seams as much as possible, and in some cases a water jacket is provided around the carbide chamber with a view to equalizing the temperature, it being the case that dissolving carbide generates heat. A constant temperature is desirable in any case, and the best way to accomplish this end is to provide a water jacket and afford a means of regulation such as will assure the generation of gas exactly in accord with the needs. In cold weather the water is likely to freeze, and this is a disadvantage to consider.

Means of Regulating Pressure.—Since gas burns under conditions involving pressure on a basis of from two to four inches water equivalent, means must be provided in connection with the acetylene tanks to maintain the constant desired pressure. The tanks are so arranged as to afford this constant pressure throughout the entire range from a full tank down to the last pound. In connection with the direct generation of gas from calcium carbide, regulation is afforded by limiting the supply of water that drips into the carbide. This water supply is automatically cared for by the pressure and means are at hand for shaking the ashes out of the carbide.

Some General Features.—It is customary, and a good idea, to place the gas tank or the generator, as the case may be, in a very accessible position not influenced by temperature changes.

The running board seems to be the logical location, and the security traps or brackets, as the case may be, are generally arranged for quick undoing. While the finish is in brass, as a rule, there are oxidized effects that are well worth considering, since they present less striking appearance and greater permanence. Bright work looks extremely well if there is not too much of it and if it is maintained bright. These conditions do not always obtain.

Incidentals of the Lighting System.—The piping from the generator to the lamps is generally a small annealed copper tube with rubber hose flexible terminals. This piping serves very well if it is not too small, although it is true that a certain surface accumulation is of an explosive nature, which accumulation is the result of chemical action between the acetylene and copper. This detail does not seem to be a matter of any great moment, because the little explosions oftentimes go unnoticed and never are of any great force. Besides copper tubing in the ordinary form, there is a line of flexible metallic hose in both copper and steel that serves very well indeed, although it is considerably higher priced.

Installation of the Lighting Systems.—If autoists have any complaint to make in connection with lighting systems it is to point out the absence of care in running the piping. Suitable fastenings are not always provided, and piping adrift is likely to cause a rattle, even if it is not damaged at points of contact. These complaints are not general, and in the better class of cars of the present time the piping work is nicely done. As a matter of fact, the tone of the work throughout lighting systems has been considerably enhanced all along the line.

The use of electric lights on the electric types of vehicles was always an attractive feature, and it has always been the desire of autoists to get away from the ills of inferior means. In recent times this question has been agitated at considerable length, and the storage battery has been so thoroughly improved as to lend itself perfectly to the purpose, thus taking care of the lighting as well as of ignition work. The batteries are small, compact and durable. They give a suitable length of service on a single charge, and the facilities for charging are now thoroughly good in every way. The systems are worked out to a nicety, and the cost is well within the means of even autoists who do not complain of a fat purse. In the early days, the batteries were not so good, and, unfortunately, the means were wretched, if not outright bad. The men who were at hand to take charge of the process knew nothing about batteries or electrochemistry, and the batteries being delicate, suffered in consequence.

In some of the systems means are provided for charging the batteries without removing them from the cars, and in the hands of autoists of the least bit of skill they are well worth while. True, many autoists prefer not to do any of the work involved in the upkeep of their cars, and with them it is more to the point to have the work done in a garage fitted out for the purpose. There are just such places everywhere throughout the land, and the scheme has the advantage of assuring one that the batteries will be handled by men skilled in the art. To what extent electric lights will be used remains to be seen.



DIETZ
"Sterling"
Lamps.
(3 Sizes.)

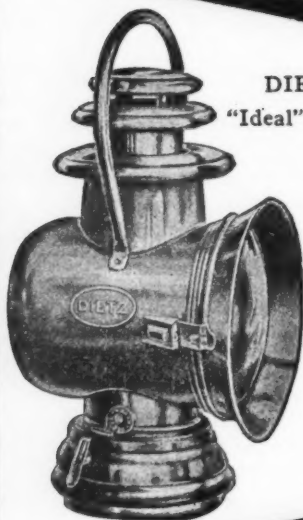


NONE "JUST AS GOOD"

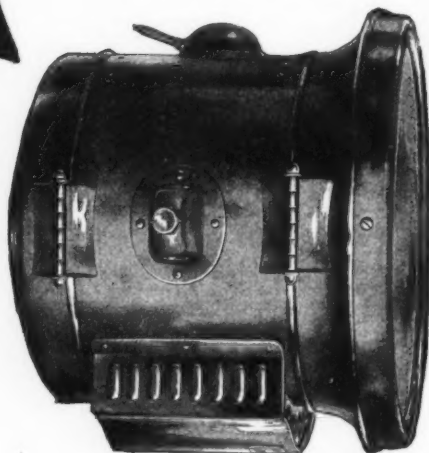
FOR
KEROSENE OIL
ACETYLENE GAS
AND
ELECTRIC CURRENT



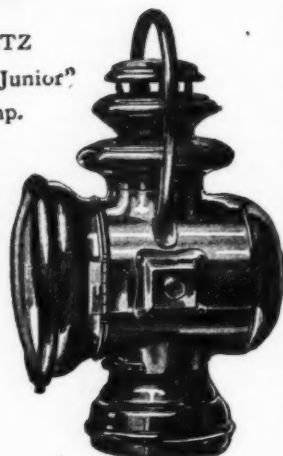
DIETZ "Excelsior" Lamp.
(Acetylene or Electric.)



DIETZ
"Ideal" Lamp.



DIETZ
Superior Headlights
and Searchlights

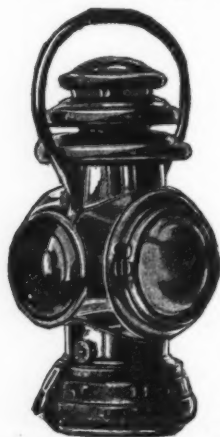
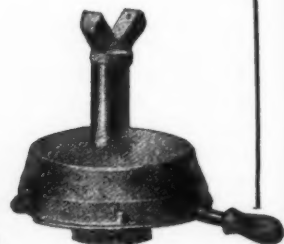


DIETZ
"Royal Junior"
Lamp.

DIETZ "Comet" (Inter-
changeable) Burner.
Fits any Dietz Oil Lamp.



DIETZ "Presto" (Inter-
changeable) Burner.
Fits any Dietz Oil Lamp.



DIETZ "Dainty" Tail Lamp.

R. E. DIETZ COMPANY

60 LAIGHT STREET,

NEW YORK, U. S. A

PIONEERS IN THE MOTOR LAMP INDUSTRY

ESTABLISHED 1840

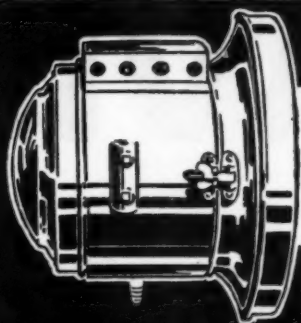
1909 CATALOGUE ON REQUEST

ELECTRIC HEADLIGHTS
ACETYLENE HEADLIGHTS
ACETYLENE SEARCHLIGHTS

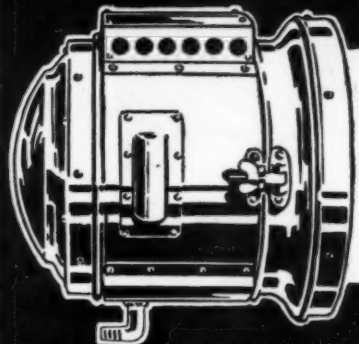
SELF-CONTAINED (Acetylene) LAMPS
THE FAMOUS "HANDY" GENERATORS (Acetylene)
OIL, GAS AND ELECTRIC LAMPS

TAXICAB LAMPS
MARINE OIL LAMPS
MARINE SEARCHLIGHTS

Do not fail to visit our superb exhibit at New York and Chicago Shows.



WHICH GIVES THE LIGHT—



THE LENS MIRROR OR THE FRONT DOOR ?

The lens mirror, of course! An extravagant front door is only of value to make a small lamp look big until it is sold. When the purchaser lights the lamps after dark he forgets all about their front doors.

There is not, and there never was, one bit of sham about Rushmore Searchlights and Headlights. They are built for service first, last and all the time; and their outward appearance is simply the artistic expression of their inward excellence. When a man has once used Rushmores of proper size, and has learned what genuine after-dark lighting efficiency is, he is never afterward content to be virtually restricted to daylight use of his car.

1909 RUSHMORE PRICES

are so low that to accept substitutes is simply a waste of good money. An output three times as great as a year ago, combined with modern factory economies everywhere, enables us to-day to sell the best lamps in the world at prices actually lower than those of the nearest imitations.

PRICES

<i>Plain Door Style Rigid Headlights</i>	<i>Plain Door Style Swing Searchlights</i>	<i>Flare Front Style Rigid Headlights</i>	<i>Flare Front Swing Searchlights</i>
6 in. size.....\$7.50	6 in. ....\$12.50	Size A.....\$ 8.50	Size A.....\$13.50
7 " "10.50	7 " 16.50	" B..... 11.50	" B..... 17.50
8 " "14.00	8 " 19.50	" C..... 15.00	" C..... 20.50
9 " "21.50	9 " 28.00	" D..... 23.00	" D..... 29.50
10 " "28.50	10 " 37.00	" E..... 30.00	" E..... 38.50

Size A lights have same lens mirrors as the 6 in. size. Size B same lens mirrors as 7 in size, etc.
No. 1 Square Automatic Shaking Grate Generator, \$12.00. No. 2 (capacity 5 lbs.), \$17.50

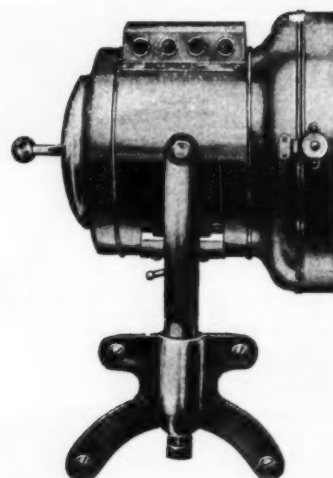
RUSHMORE DYNAMO WORKS

PLAINFIELD, N.J.—CHICAGO, ILL.—LONDON.—PARIS.

GRAY & DAVIS

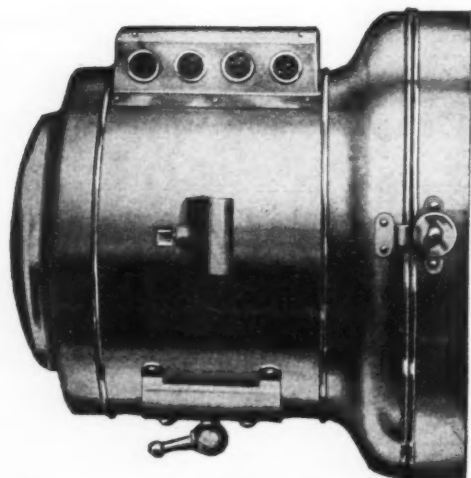


Style Nos	96	97	98
Price, each	\$11.50	\$15.00	\$25.00
Diameter Flange	9 $\frac{1}{2}$	10 $\frac{1}{2}$	11 $\frac{1}{2}$
Extreme Length	8 $\frac{1}{2}$	9 $\frac{1}{2}$	10 $\frac{1}{2}$
Extreme Height	9 $\frac{1}{2}$	10 $\frac{1}{2}$	11 $\frac{1}{2}$
Distance between cen. props.	7 $\frac{1}{2}$	8 $\frac{1}{2}$	9 $\frac{1}{2}$



Style Nos	868	870	872
Price, each	\$13.00	\$16.50	\$20.00

1909 STYLES AND PRICES



Style Nos	867	869	871	873
Price, each	\$8.00	\$11.50	\$15.00	\$20.00
Diameter Flange	9 $\frac{1}{2}$	9 $\frac{1}{2}$	9 $\frac{1}{2}$	10 $\frac{1}{2}$
Extreme Length	8	9	9 $\frac{1}{2}$	11
Extreme Height	9	9	9 $\frac{1}{2}$	10 $\frac{1}{2}$
Dis. between cen. props.	7 $\frac{1}{2}$	8 $\frac{1}{2}$	9 $\frac{1}{2}$	10



Type G Generator
Price, each..... \$13.50

NEW YORK CITY
377 West Broadway

Main Office and Factory
AMESBURY, MASS.

BOSTON, MASS.
749 Boylston Street

GRAY & DAVIS



Style No. 938

Price, each.....\$9.00
 Size Body.....5½x5½
 Extreme Height.....14½ ins



Style No. 935

Price, each.....\$9.00
 Size Body.....5½x5½
 Extreme Height.....14½ ins.



Style No. 936

Price, each.....\$6.50
 Size Body.....5½x5½
 Extreme Height.....14½ ins.

1909 STYLES AND PRICES



Style No. 934

Price, each.....\$5.50
 Size Body.....4½x4½
 Extreme Height.....13 ins



Style No. 917

Price, each.....\$5.00
 Diameter Flange.....5 ins.
 Diameter Ruby Jewel...3½ ins
 Extreme Length.....5½ ins
 Extreme Height.....11½ ins



Style No. 15

Price, each.....\$3.50
 Diameter Flange.....4½ ins.
 Diameter Ruby Jewel...3 ins.
 Extreme Length.....5 ins.
 Extreme Height.....9½ ins

NEW YORK CITY
 377 West Broadway

Main Office and Factory
 AMESBURY, MASS.

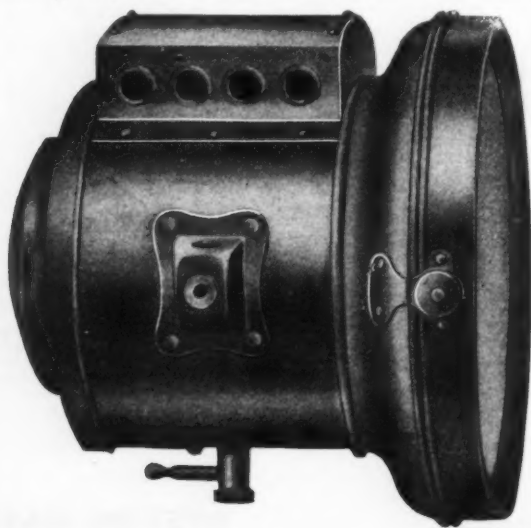
BOSTON, MASS.
 749 Boylston Street

'09 Corcoran Lamps

You Don't Have to Experiment with Auto Lamps and it isn't necessary to Spend a Powerful Lot of Money to Get the Best.

CORCORAN LAMPS

have been made by one concern for nearly a hundred years and think you that in this time that anything good in the lamp way has ever gotten past "CORCORAN." Before you were born, very likely, "CORCORAN" Lamps were good lamps and down to the succeeding years they have been good lamps and for years to come they'll be good lamps. Besides being good lamps (none better are made, anywhere by anyone), they are lamps that cost you but little. Years of fine lamp building has pointed economical methods of manufacture; the economy so ac-



quired, the saving we make we divide with you, so you get as good lamps—better than most—at a very low

cost. Is there any reason why you should set up a search for Auto Lamps when you don't have to, when you can come to us and be assured of complete and lasting satisfaction?

In any event it won't hurt and it won't cost anything to find out and we feel sure that you will be well pleased with the results of any investigation you set on foot.

CORCORAN LAMP COMPANY

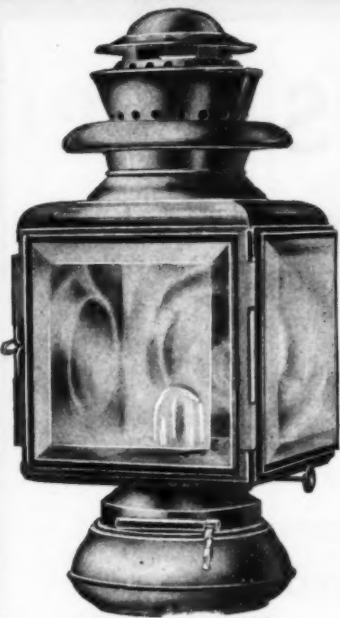
Cincinnati, Ohio.

There is a clever profit in CORCORAN LAMPS, as the dealer who handles them will quickly realize. Dealers:—Ask for the CORCORAN profitable proposition.

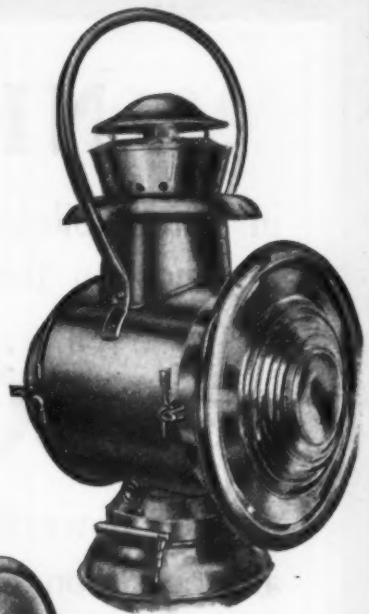


HAM'S "COLD BLAST" AUTOMOBILE LAMPS

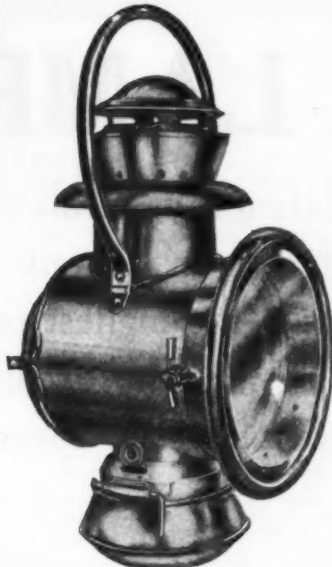
Beautiful in appearance. Made very strong of the highest grade, heavy gauge brass and producing a brilliant light. Guaranteed not to blow or jar out. Ham's are without a doubt the finest burning automobile lamps on the market.



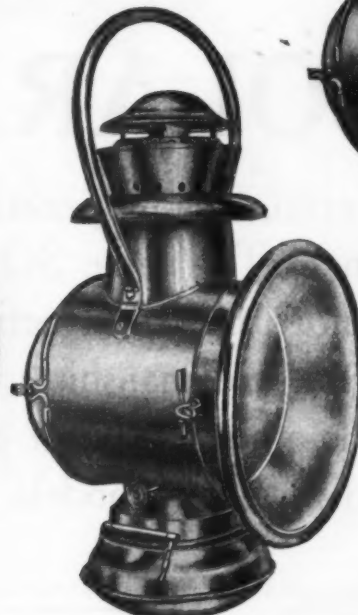
HAM'S LIMOUSINE



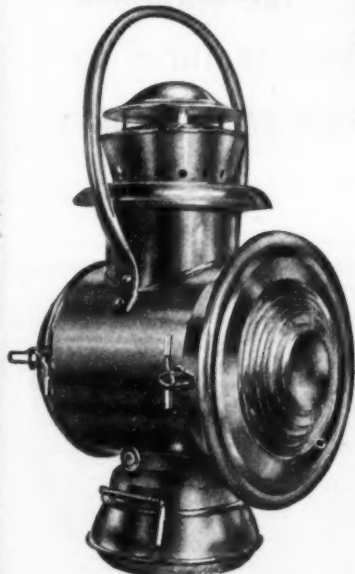
HAM'S TOURIST



HAM'S STAR



HAM'S CORONA



HAM'S METEOR



HAM'S COUPE



HAM'S MARS
Tail Lamp



HAM'S VIGILANT
Tail and Inspector Lamp



HAM'S APEX



HAM'S RELIANCE

See our exhibit at Grand Central Palace Show. "Space 166, Section U." Opening in New York City on New Year's Eve.

Also write for one of our Handsome New 1909 Catalogues, just out. Address "Dept. B."

C. T. Ham Mfg. Co.
ROCHESTER, N. Y.

NIGHT RIDERS!

in automobiles require perfect light—their safety and comfort depends on the efficiency of their lighting equipment.

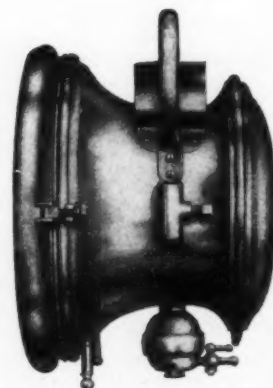
SOLAR LAMPS

provide powerful, steady, penetrating rays at all times and under any conditions. The name SOLAR on a lamp represents perfection in motor lamp construction—the highest possible standard in material and workmanship. Besides the exclusive features to be found in no other lamp, our complete line covers a great range of prices and variety of models.



Solar Lens Mirror Headlight, 956-A,
6-inch Lens Mirror, each \$8.00

Gas Headlights,	from \$4.50 to \$62.50 each
Electric Headlights,	from \$8.75 to \$15.00 each
Generators,	from \$4.00 to \$12.00 each
Oil Side Lamps,	from \$7.50 to \$22.00 pair
Electric Side Lamps,	from \$9.00 to \$21.00 pair
Oil Tail Lamps,	from \$3.50 to \$7.50 each
Electric Tail Lamps,	from \$3.75 to \$6.00 each



Solar Lens Mirror Projector,
7-inch Lens Mirror, each \$17.50

Uniform equipment on a car is an index of care and skill. A high-grade car is handicapped by cheap lamps. A medium-priced car increases both in efficiency and appearance by good lamps—**SOLAR LAMPS.**

See our exhibit at the Grand Central Palace and Madison Square Garden Shows

BADGER BRASS MANUFACTURING COMPANY

TWO FACTORIES

437 Eleventh Ave., New York

Kenosha, Wis.

1909

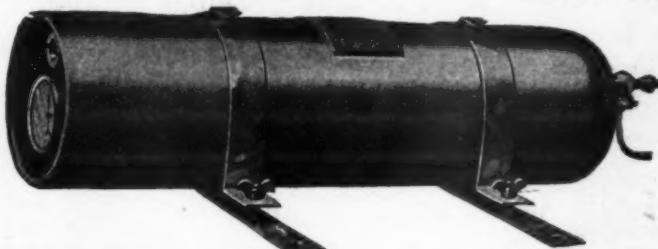
PURITAN GAS TANKS

are STANDARD and
will continue to sell
on MERIT

Electrotypes now
ready for jobbers'
1909 catalogues and
will be mailed on re-
quest.

OUR POLICY

NOT THE CHEAPEST — BUT THE BEST



From the beginning we have always maintained the QUALITY,
EFFICIENCY and DURABILITY of

PURITAN GAS TANKS

While competitors have already made startling CUT PRICE
announcements, it will not tempt us to jeopardize quality
(which is the all important gas tank requisite), and we do not
feel warranted in meeting figures based on gas tanks which are
manufactured to be sold at a low price.

We have no hold-overs or consignment stocks to unload on
the Public, so there is no occasion for auction prices.

1909

One Quality & One Price

is OUR POLICY for
1909

Our new and well
equipped plant at
Canton, Mass., is now
running day and night
to meet the increasing
demand, and the end
is not yet.

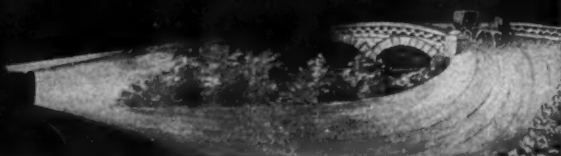
PURITAN GAS TANK COMPANY

45 MILK STREET

Agencies: New York, Boston, Philadelphia, Pittsburg, Baltimore, Rochester
Chicago, Hartford, Toledo, Detroit, Canton, O., St. Louis
Sioux City, Los Angeles, Etc., Etc., Etc.

BOSTON, MASS.

Prest-O-Lite Gas Tank



The Light That Fails Not

Strong, steady dependable light,
turned on and off like a gas jet.
Clean, safe and economical.

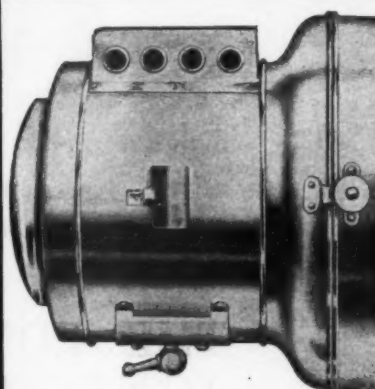
Used by all experienced motorists.
Refilled tanks obtainable every-
where. Beware of imitations.

The Prest-O-Lite Co.

New York, 1904 Broadway
Indianapolis, 229 E. South St.
Philadelphia, Race and Carlisle Sts.

Boston, 607 Boylston St.
San Francisco, 520 Van Ness Ave.
Toronto, 6 King St. W.

2500 Exchange Agents



Lamp Equipments

AT
Popular
Prices

In the first place we make
Lamps as well as they can
be made; after that, we sell
them at a very modest price,
quite a low price, in fact.

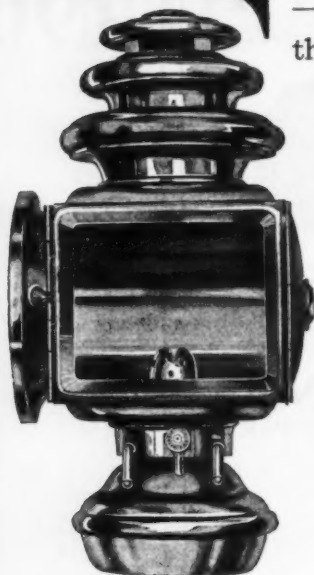
May we send you a sample?
So's you may inspect and
know all about it.

We are especially proud of
our lamps for moderate-
priced cars.



VICTOR LAMP CO., Cincinnati, O.

DETAIL Construction and Perfect Combustion are the underlying principles that make E & J Oil Lamps pre-eminently superior to all others. The knowing ones—auto manufacturers, dealers and private owners—equip their cars with E & J Lamps because they know that E & J Lamps are the world's finest equipment. Our years of experience in the art of Lampmaking has enabled us to accomplish these results, wherein all others have failed. Especial attention is directed to our Tail Lamps, which are the



No. 5

Premier
Tail Lamps
of the
world. The
least you



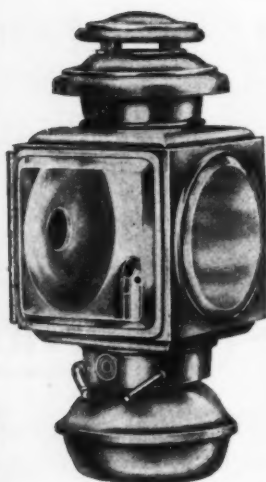
No. 4

can do is to start an
investigation on foot in
relation to the merits of
E & J Lamps. Ask



No. 3

manufacturers, ask dealers, ask
users, ask us, only do it soon for
your own good and the successful
lighting of your 1909 cars.



3A

See us at the
Shows,

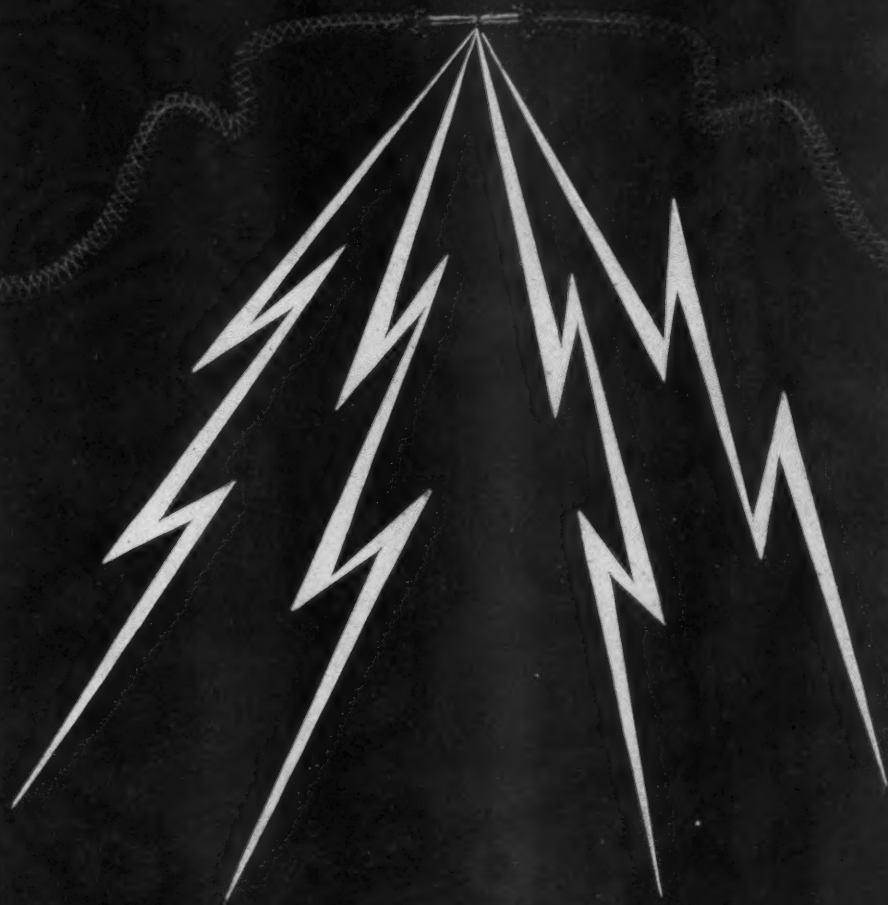


No. 1 Tail Lamp

**THE EDMUNDS &
JONES MFG. CO.**
313 Riopelle St., DETROIT, MICH.

Or
Write us.
Write to-
day

Ignition Section



INCLUDING

Magnetos, Spark Coils, Timers, Spark Plugs,
Batteries, Electrical Fittings, etc..

This is the Magneto that Stands the Most Abuse—See it at the New York and Chicago Automobile Shows

The Remy High Tension Magneto is designed especially for American Automobiles. The broadest margins for abuse—both electrical and mechanical—are afforded on the Remy. It is "fool proof."

Positive firing is assured by the Remy under conditions of oil, dirt and water that puts its competitors out of commission.

It will fire the motor properly running at a lower speed than any other Magneto in the world. This is a big point in cities where cars must be run at low motor speed as often as high motor speed.

Anybody can install a Remy whether he is a skilled mechanic or not.

This is the Magneto without brushes. No brushes to wear out, give trouble or be replaced.

The Remy

1909 High Tension Magneto

Double ignition with one set of spark plugs is another Remy feature originated by us.

Starting may be done from the seat of the car without cranking—with the greatest certainty of any system starting from the spark.

We have sold on minimum specified deliveries over 17,000 Magnetos for 1909 cars. More of these Magnetos are already sold than all other makes combined.

With automobile manufacturers continually striving to build better cars than their competitors, there is a reason for their adopting the Remy Magneto.

It is designed by engineers who have been connected with automobile work since its beginning and embodies ideas suggested or approved by the largest manufacturers.

Our factory was built especially for Magneto manufacturing and is the largest of its kind in the world.

In the hill climb endurance run—speed contest—in all kinds of tryouts everywhere, the

Remy has more victories to its credit than all other makes combined. The Buick, equipped with the Remy Magneto, led all American cars at Savannah.

This is a sample of the letters we receive daily:
Boston, Mass., Sept. 30, 1908.
"Remy Electric Company.

We have recently entered several racing events and our cars, equipped with your ignition apparatus, have all made wonderfully good records.

At Montreal, our Model 5 had captured eight out of nine events beating Christy and Barney Oldfield's machine and tying for the fastest half mile track in 1:12. This car was equipped with your Magneto and as the report shows, ran faultlessly throughout the several events.

Buick Motor Company,
Boston Branch,
H. K. Hoyes, New England Mgr."

Write us for illustration and full description of our new high tension Magneto. We are building them in such large quantities that we can make you very attractive prices. We furnish fittings for attaching these Magnetos to many of the old models of the different American cars.

Write us today. Address Dept. 12.

Remy Electric Co., Anderson, Ind.

We have opened a branch house at Thoroughfare Building,
Broadway and 57th St., New York

Our Show Exhibits are Located:

Grand Central Palace Madison Square Garden Chicago Coliseum
Gallery, Space No. 188 Space No. 125, Elevated Platform Gallery, Space No. 65



Regular Equipment on these Cars

Regal Motor Car Co.
Maxwell-Briscoe Motor Co.
Apperson Bros. Automobile Co.
Model Automobile Co.
Overland Automobile Co.
Kissel Motor Car Co.
Crawford Automobile Co.
Midland Motor Co.
Cameron Car Co.
Olds Motor Works.

Buick Motor Co.
Pope Motor Car Co.
Buckeye Automobile Co.

the
w
bu
ne
ra
re
of

th
we
bu
ne
ra
rep
of



IF there is any one point in relation to automobile motors that influences for good or ill, according as the system is noteworthy or not, it is the ignition. If the carbureter does not work very well, it is the ignition system that will disguise the fact if the same is of a high order of merit and in good working order. With a good ignition the mixture will scarcely have to be up to a point of high inflammability, whereas if the ignition is not efficient even good mixtures will ignite with difficulty. Under the circumstances it would be by far better to do without some luxury with the idea of purchasing the best possible ignition devices, which, however, would be to no purpose were they but poorly installed.

That a "dual" system of ignition is well worth having is not to be denied, which is not to say that some parts of the system may not be in common. The practice of using a single timer, for illustration, the same to serve for both the magneto and the coil, is not one to be condemned. On the other hand, there is no objection to separating the systems in such a way as to possess two complete and independent ignition systems. Some of the modern low-priced cars are provided with a magneto in conjunction with a "transformer," battery and timer in common. Certainly this is better than the earlier practice, in which a coil and dry battery constituted the whole ignition proposition.

The superior grades of magnetos are rather costly, and it goes without saying that the very low-priced cars can scarcely stand the expense, especially if a dual system is provided. In making a choice it is not far from right in such cases to select a magneto, and some means for starting. At all events, the whole situation is much improved over what it was in the past with divers choices for autoists of discernment.

Magnetos Moved Up to First Place.—That the magneto is now regarded as of the first importance can be taken for granted, which point is adequately illustrated in numerous of the automobiles to be seen at every hand. In one case the magneto is built into the flywheel, thus becoming a part of the motor as it were. In many of the important products the magneto is regarded as finality, if a dual system is used, and in some cars the magneto is considered adequate for the purpose, irrespective of the fact that a dual system of ignition may be provided. In other words, the time has passed when it will be proper to consider the magneto in the light of an auxiliary to the coil system. It is the coil system that has reverted to second place in the onward march of ignition systems.

If magnetos have advances in utility, it is equally true that the coil systems have made strides also. In the old days coils were not quite up to a fitting standard, primarily because the bundle of wire in the magnetic circuit was not of a high magnetic permeability. The lag of the spark was not at a constant rate, and the same lag was overmuch. The result was that the regulation of the spark was beyond the ability of the operator of the car, unless at the lower speeds of the motor. Maximum

power of the motor could not be expected under such conditions, nor was it realized within a considerable margin.

The "high tension jump-spark," as compared with the "low tension wipe-spark," it is futile to take space to discuss relatively. The users of both swear by them, and each user backs up his statements with evidence such as cannot be refuted. The probabilities are, both systems being so thoroughly good as to serve well the purpose, it is purely "hair splitting" to discuss the relative merits with a view to finding a difference.

Magnetos have other differences mostly as respects the details of the magnetic circuit, and in placing of the secondary windings as well as the condenser. When reference is had to the quality of the materials in the permanent magnets, there may be differences, since the materials do not all come from the same hole in the ground. As respects the utility of the respective qualities of materials used in the permanent magnets, it is quite another matter to differentiate. It would take a long series of tests to establish the facts, and the cost of the investigation would be out of all proportion to the benefits likely to be derived. In other words, all the materials used are so thoroughly good as to serve well the purpose, and from the point of view of the users of cars it would be a task to try to discriminate. The makers of cars can be relied upon to keep an eye on this phase of the question, since it is to their advantage to see to it that the magnetos they use are provided with permanent magnetos of a stable character. On the whole, the magneto situation is on a very thoroughgoing basis, leaving little to be desired.

Situation in Relation to Coils.—The slight reference made to coils was indicative of improvements in the magnetic circuit windings and insulation, and if coils are better in these ways, it is true of them also that they are improved in all ways. Take, for illustration, the "unit trembler," in which any number of coils are under the control of one trembler only. Certainly it is far less trouble to adjust one trembler for several cylinders than it is to try to adjust one trembler for each cylinder. Then, again, there is the scheme in which one coil is used in common for all the cylinders, taking into account a high tension jump-spark distributor, which coil can be with or without a trembler.

In this class of work, if no trembler is used, the timer is so adjusted as to afford a very short period of contact, thus delivering but one spark at a time; and delivering the same at the propitious moment. One good spark at the right time is what is wanted in any case, and any system that will deliver the one "high energy" spark will serve well the intended purpose.

This is not to say that there is any disadvantage in delivering a series of sparks, as in the coil with a trembler, for there can be none. Indeed, if assurance could be had of delivering a series of sparks so timed as to ignite the "mixture"—(a) at the propitious instant; (b) as many times as possible thereafter—the rate of flame propagation would be greater, and, within limits, it would be an advantage. If no guarantee can be had of de-

livering a series of sparks on the basis as above outlined, the next best thing is one spark at the right time. Fortunately, the several systems are so thoroughly perfected as to perform their functions to a degree of perfection leaving little to be desired.

There are still to be had the class of coils in which a trembler is used for each coil. Some autoists claim that the compression differs in the respective cylinders enough to demand recognition. In other words, they claim that by adjusting the separate tremblers for the respective coils and cylinders, they realize more uniform results; and they probably do. The only point is, it takes a little more skill than can be expected from a novice, and, besides, it would be possible to adjust compression as well as the spark in a case of this sort. These same autoists set up the contention that absolutely independent ignition systems for each cylinder would be an advantage in case of a break down of any coil. There is a good deal in this, since coils are extremely difficult to repair. On the other hand, it is a fact that of all the equipment in cars, coils seem to hold out the best; indeed, it rarely ever happens that the coils fail in actual service. When they do, it is because of positive abuses and much exposure to the elements under sharp variations in temperature.

Advantages of Various Types of Batteries.—The storage battery ranks first because of its higher voltage on open circuit, its lower internal resistance, and its consequent higher "watt" efficiency. Of the storage battery it is also possible to say the actual available energy is considerably higher at a higher rate of discharge. If these are characteristics of storage batteries, it is also true of them that they are "wet" and the "spillage" is diluted sulphuric acid. True, the batteries are very effectually sealed, and the spillage does not amount to anything at all in the cases in which the batteries are accorded a fair measure of attention. If storage batteries are charged at regular intervals, and the electrolyte is maintained at its right strength, they serve well their intended purpose, and well repay the autoist.

Dry batteries are used extensively and in the larger sizes, excepting when they are used as seconds, in which service it is not expected of them to do more than answer to an emergency call. There is no denying the fact that if dry cells are used, it pays to employ the larger sizes. They last far longer and during their life they afford a better result, since the internal resistance is lower and the amount of depolarizer is in far greater excess. In the earlier times the battery connectors were something of a nuisance, but this is of the past owing to the improvements wrought in this direction. It is now possible to purchase batteries of the "dry" variety in boxes of great utility, so arranged that the connections are made automatically.

As between the two types of battery, choice depends upon the point of view. If one cannot have the storage battery charged at regular intervals, it is a waste of money to buy it, in which event the dry battery has many points of superiority. If the coil is economical, the dry battery serves very well in any case. If the battery is for emergency work only, the dry battery will do.

Besides storage and dry batteries, there are primary batteries that should have a place in this class of work. They are good current givers, and the replacement of the "charge" is attended with little or no difficulty. These batteries are of the "wet" description, and on that account may not be preferred by some. To seal them should not be a great task; sealing is effectual in the storage battery work. The difference between a primary and a storage (secondary) battery lies in the fact that with the primary battery the elements are wasted away, and have to be replaced when they give out. In a secondary (storage) battery, the elements do not give out during the natural life, and to recuperate the battery it is but necessary to recharge the same.

Battery boxes are to be had in wood, highly finished, and in pressed steel; under lock and key, if desired. They are made in a variety of sizes to fit on the running-board or under the seats. Batteries are made in certain sizes, and the makers of boxes have taken this fact into account. This automatic cooperation has resulted in the lowest possible first cost, quick deliveries, and the highest possible quality of the respective products.

Something About Chemicals Used in Batteries.—Storage batteries are provided with a solution of sulphuric acid in distilled water. The strength of the same is 25 degrees Baumé. The water must be distilled in a tin-lined equipment and must be free from iron, chlorine, nitrates, mercury, copper, arsenic, and such other ingredients as might introduce undesirable chemical action. A storage battery will last for a long time if it is not allowed to become contaminated by some one of the elements or compounds such as will induce chemical action. There is nothing that will so quickly reduce a battery to a useless state as iron, chlorine, or nitrates. Any of these ingredients can come from the water or from the surroundings. Electrolyte can be purchased from the chemists, guaranteed pure and of the right strength.

Dry batteries do not have to be replenished unless they are allowed to dry out, in which event it is possible to recuperate them by spilling water into them, in which water a little sal ammoniac will serve a useful purpose. Primary batteries may require caustic soda or what not, depending upon how they are made. In any event, it is desirable to use pure chemicals from a reliable source.

Electrical Conductors, Terminals and Fastenings.—However a good coil or a magneto may be it is of no practical avail if the insulation on the secondary winding is below the requirements. It is not far from right to claim that the electromotive force in the secondary circuit of a modern "transformer" will reach the enormous instantaneous value of even 40,000 volts. The wave is an irregular saw-tooth, and the electrostatic strain is so very great as to require an extra thickness of the finest insulation to sustain under such conditions. It is a simple waste of time to use anything but the superior grades of insulated wire in secondary circuits, and the manner in which the terminals are made up is a matter of some moment. Fortunately, suitable grades of insulated wire are to be had and builders of automobiles are alive to the needs of the service. In repair work, or in going over a car, it is not unusual to see repairmen make splices in the wiring. The secondary wires should not be spliced, because it is not easy, if possible, to maintain the high insulation resistance of the wire that should and does obtain when the insulation is new and not spliced.

The primary wiring does not have to transmit high electrical pressures, but the joints have to be good because the voltage is low. With a low voltage, if a joint is not good, the resistance becomes so great as to defeat the aim. Terminal connectors should be used, and in every possible case the joints should be soldered. There are divers forms of terminal connectors to be had; they all answer the purpose to a greater or less degree, and none of them is so inferior as to warrant going back to the simple expedient of twisting the bare wire around the terminal screw.

Of Spark Plugs There Are a Plenty.—The spark plug situation is in good shape, with a considerable selection at the disposal of the autoist. The underlying idea is the same in most of them, but there are considerable differences in point of detail. Of insulators, there are the porcelain tubes on the one hand, and mica on the other. Porcelain is so much improved in modern spark plugs as to give almost no trouble at all, while mica, if it is well selected and nicely put together, will last for a very long time. The details of finish of spark plugs are much more refined than they were in the past, and the question of the standardization of the thread in the cylinders is receiving a due measure of attention. Ofttimes the trouble experienced with spark plugs is due to ill-fitting threads that allow the plugs to screw in more than they should, or a leak is developed around the plug. In some cases in the past, the plugs were not located in the most efficient zone, in view of the uncertain nature of the mixture in the cylinders. If motors are with a high compression, the question of the location of the plug is not a matter of so much moment provided the sparking equipment is suitable for the purpose in view of a high compression, it being the case that the higher the compression the greater the resistance.

U & The MAGNETO That U & Never Needs Spinning



O "spin" the whole engine simply to get a sufficient spark from the magneto is as irrational as it would be to push the whole car to start the engine. If the magneto were disconnected you could spin it with one finger, but it takes a strong man to spin a large engine.

Nothing is more certain than that the magneto of the future will be free from this irritating handicap. The UNTERBERG & HELMLE SELF-STARTING MAGNETO (Type LE) is free from it *to-day*. It produces a spark of high intensity on the slowest half turn of the crank. You do not have to spin the engine to start from "cold." You do not have to pump the gas out of the cylinders when the engine is warm and take your chance on what the carbureter may give you. You do not have to carry along a battery and special coil to do what the magneto *ought* to do.

The UNTERBERG & HELMLE SELF-STARTING MAGNETO is a complete ignition equipment in itself for *all* speeds and *all* conditions.

For 4-cylinder motors up to 35 h.p., the new type CB-4 embodies some interesting features. Look for it at the Shows.

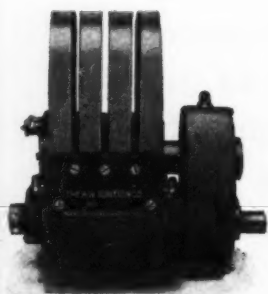
J.S. BRETZ COMPANY
Sole Importers, Times Bldg, New York

K-W K-W K-W K-W K-W K-W K-W K-W K-W K-W K-W K-W K-W K-W K-W K-W K-W

K-W If you want the best, simplest and most reliable Ignition System, install a **K-W**

K-W Magneto and K-W Coil

and Forget You Have Any Ignition



The New Model "G" K-W Magneto, \$50.00

GEAR DRIVEN AT ENGINE SPEED
and works with a vibrating
coil and timer.

GUARANTEED TO START WITHOUT BATTERIES.

The model "G" K-W Magneto was designed with the sole purpose of replacing the complicated High Priced High Tension Magnetos of other makes that go wrong. It has standard base and will fit in place of Magneto you take off, or in place provided for Magneto on your motor.

READ THIS:

Minneapolis, Minn., Dec. 1, 1908.

Gentlemen—Wish to say that I have a K-W Magneto installed on my Pierce-Arrow car and there are no words too good to use in connection with this outfit. It is giving perfect satisfaction, and in fact giving much better results than it was possible to obtain from a high priced Magneto which has been installed and taken off from the car in question. Enough said.

Yours very truly, (Signed) S. S. JOHNSON.

We can show thousands like this. It's what they all say.

The K-W Magneto is simple and efficient because it is designed right; reliable and durable because it is built right; cheap because it is simple. No complicated traps and triggers to go wrong—no moving wires or brushes or contacts. Runs in Ball Bearings and is built to last, and does last.

We make Magnetos for both make-and-break, and jump spark ignition in belt, friction and gear drive, and are constantly adding to our line. Get our catalogue now.

We want live dealers to handle our line in every city. If you can't see us at the show, write us.

WATCH FOR THE NEW K-W HIGH TENSION MAGNETO WHICH WILL BE EXHIBITED FOR THE FIRST TIME AT THE SHOWS. IF YOU WANT TO SEE THE MOST ADVANCED TYPE OF HIGH TENSION MAGNETO—THE BEST ONE YET—SIMPLE, DURABLE, RELIABLE, LOOK US UP.

SPACE 223 MADISON SQUARE GARDEN, NEW YORK CITY, JAN. 16th to 23d.

SPACE 387 BOSTON SHOW, MARCH 6th to 13th.

SPACE 38 NATIONAL MOTOR BOAT SHOW, NEW YORK CITY, FEB. 15th to 23d.

THE K-W IGNITION CO., 34 Power Ave., Cleveland, Ohio, U.S.A.

New York Representative.....A. H. Green & Co., 1686 Broadway, New York City.
Boston ".....W. J. Forbes, 220 Congress Street.
Chicago ".....The Automobile Supply Co., 1339 Michigan Bldg.

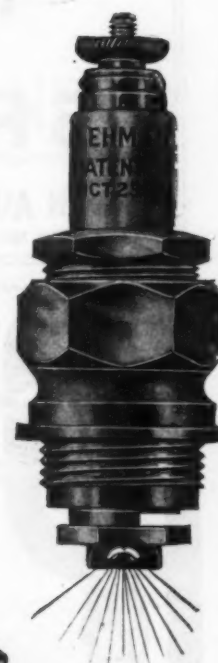
Canadian Representative:
The Canadian General Electric Co.
Toronto

K-W K-W K-W K-W K-W K-W K-W K-W K-W K-W K-W K-W K-W K-W K-W K-W K-W

THE
"FULMINA"
 HIGH-TENSION
MAGNETO
 ALL TYPES

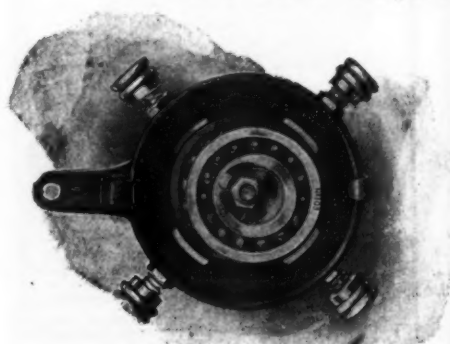


Sectional View,
 Showing Detail of
 Construction.



ADDRESS

NO 170 BROADWAY



LEHMAN
DISTRIBUTORS
 and
TIMERS





PITTSFIELD IGNITION SYSTEM

New Pittsfield Magneto Plug

Two spark gaps in same plane, which is at right angles to axis of plug. Both sparks of equal efficiency, firing straight out into mixture. No gland or packing nut used. Long, accurately fitted taper of bushing and plug makes it absolutely gas tight. Insulation is the very best mica washers subjected to enormous pressure, making them practically a solid block of mica. Clean and sootless during its whole life. Unqualifiedly the best magneto plug on the market. Unapproachable in its record for efficiency and durability. Made for service and not merely for show.

New Pittsfield Switch

This latest product of the Pittsfield Spark Coil Co. overcomes all the defects of other switches, and has none of its own. Unbounded satisfaction is assured, as quick, positive changes are made which cannot jar away from contacts. Batteries perfectly safe from all danger of short circuiting through this switch, as there is no chance for the closing of the battery circuit when plug is removed. Wiping action of contact surfaces makes dirty contacts impossible. Can be easily substituted for other and inferior switches. Two styles—two batteries and magneto and battery. Practically as safe as an unpickable lock. Its own plug must be used. Thieves are completely baffled.

Pittsfield Spark Coil

Pittsfield Spark Coils represent all that is best in design, material and construction. The boxes are of finest solid mahogany, beautifully finished. The windings are of magnet wire of the highest grade obtainable. Specially prepared insulation so perfect that short circuiting is impossible. Absolutely moisture-proof. Patent vibrator, acknowledged to be the fastest made. Dependable in its action, making a perfect electrical connection at every impulse. Breadth of adjustment far superior to any other. Condensers carefully made in proportion with working parts of coil resulting in consumption of but one-half ampere of battery current on short circuit and one-tenth ampere when engine is running.

Write at once for our new catalog

Pittsfield Spark Coil Company, Dalton, Mass.

"RAJAH" SPARK PLUGS

IGNITION ABSOLUTELY SURE

RAJAH AUTO SUPPLY COMPANY BLOOMFIELD, NEW JERSEY
Watessing Station, D. L. & W. R. R.
JOHN MILLEN & SON, Ltd., MONTREAL, TORONTO, VANCOUVER



Perfection in plug making

The "BREECH
BLOCK" Plug
With Improved Clip and Handle

Nothing equals it or compares with it in any way. It is a distinct improvement over all others and is in a class by itself. It is not only perfect in mechanical construction and finish, but the limit of economy of time in use.

HERE ARE SOME OF ITS ADVANTAGES:

Terminal Clip and Handle, an instantaneous wire attacher.
Breech Block feature allowing the plug to be removed and cleaned by giving the handle a 1-6 turn.
Soft Copper Gasket between breech and block seal ground to perfect contact.
Cup Shaped Terminal which prevents foreign substance from dropping into cylinder.
All Parts Interchangeable.
Porcelain Touches No Metal Part, floating free in asbestos gaskets.
Over One Inch of Insulation.
These and other features, together with perfect construction throughout make the BREECH BLOCK PLUG better than anything else to be had at any price.
Try a Breech Block Spark Plug and you will use no other.
Full descriptive matter on request.

STANDARD COMPANY
TORRINGTON, CONN.



POCKET Battery Ammeter

0 to 30 Amperes

Indicates in any position and in either direction of current. In testing single cells, the cord is not necessary. Price, \$3.50
Eldredge Elec. Manufacturing Co.
Springfield, Mass.



Test your batteries with a meter that is accurate, durable and guaranteed.

ROBERT VOLT-AMMETERS, \$6.00
" VOLT-METERS, \$4.00
" AMMETERS, \$4.00

including leather case

Send for catalog
Robert Instrument Co.
66 Shelby St., Detroit, Mich.

We are the largest producers of spark plug bodies in the country, and are now making the bases or bodies for a number of the largest spark plug manufacturers. Our equipment of automatic and screw machines is very complete and up-to-date, and we are prepared to quote very low figures on this class of work to anyone that is in the market, and on any quantity. Our facilities along this line are practically unlimited, and while we are doing a large share of the spark plug body work at the present time, we want more of it if we can get it.
ECLIPSE MACHINE CO. Elmira, N. Y.

THE MOSLER
Spit Fire Spark Plugs
Are the Best
A. R. MOSLER & CO.
101 West 20th Street New York City



GEISZLER STORAGE BATTERY

Non-Sulphating

6 VOLT, 60 AMPERE HOUR

Price, \$15.00

GUARANTEED FOR ONE YEAR

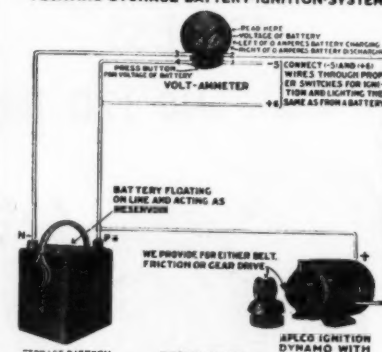
Send for Catalog A

GEISZLER BROS.

514 W. 57th St., New York City

We announce the "APLCO" Perfected DY-
NAMO-FLOATING STORAGE BATTERY
IGNITION and LIGHTING SYSTEM for
Automobile, Motor Boat and Stationary Engine.
Make and Break or Jump Spark Ignition.

WIRING DIAGRAM OF "APLCO" DYNAMO-
FLOATING-STORAGE BATTERY-IGNITION-SYSTEM



SPECIFY and pay the difference for an "Apco" system on your next automobile, motor boat or stationary engine and it will pay a handsome interest on your investment. Send for Bulletin No. 3, giving prices and complete information. We will demonstrate this system at Booth No. 217 Madison Square Garden January Sixteenth to Twenty-third.
APPLE ELECTRIC CO., 16 N. Canal St., Dayton, O.

Let us send you a DUPLEX COIL to use on your car 30 days free in place of your present coil. If the Duplex Coil doesn't cure 90% of your engine troubles, send it back collect, and replace your old coil. Write on your business stationery, giving name of car, number of cylinders, and any good reference and we'll send you a Duplex Coil by first express.

Address Station N,
DUPLEX COIL CO., Fond du Lac, Wis.



The "GOTHAM" STA-RITE will end your spark plug troubles. It can't stick to the porcelain. Won't short circuit. Never leaks. Can be taken apart and cleaned with ease. Of dealers or direct, \$1.00

The R. E. HARDY CO., 25 W. 42d St., New York

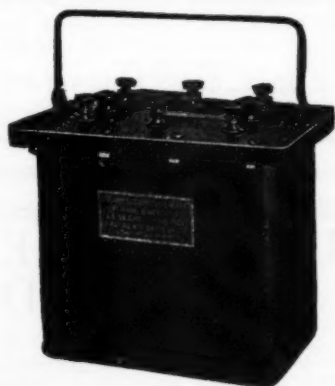


Cuts now ready for 1909 accessory catalogues

MAGNA QUICK CHANGE RIGID BATTERY HOLDER

USES any STANDARD dry battery.
NO connections to work loose.
IMPOSSIBLE to connect cells up wrong.
BATTERIES held absolutely rigid.
TAKES less than two minutes to change set of six cells.
BOX carried same as storage battery.
Price, 6-cell box \$6.00

R. W. MAGNA MFG. COMPANY
Holyoke, Mass.



High Efficiency, Non-Sulphating Ignition Batteries

Capacity Guaranteed
6 volt 60 ampere size \$10.00 net, cash with order, for limited time.

TRAY PLATE BATTERY CO.
Frederick St., Binghamton, N. Y.

PIRELLI  CABLE



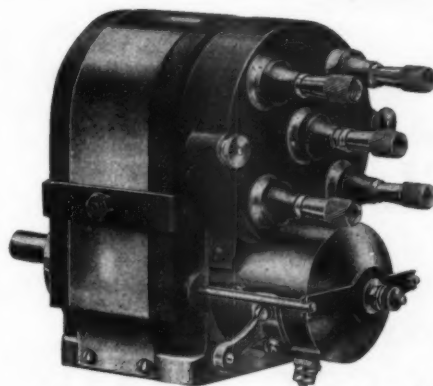
Our Cable Card illustrating 11 varieties of cable in actual sizes mailed upon request.

This is No. 254 R, 15 m. m. High-Tension Rubber. Price, 30c. per foot. To avoid ignition trouble, specify PIRELLI wire.

PIRELLI & CO., 296 Broadway, New York

FOR SALE by MOTOR CAR EQUIPMENT CO., 55 Warren Street and 1727 Broadway

THE PRACTICAL GAS ENGINEER. What to Do and How to Do It. A book of 150 pages, neatly bound in cloth. Sent postpaid for \$1. Address Book Department, The Automobile, 231-241 W. 39th Street, New York.



Announcement to Manufacturers

LATEST!
BEST!
CHEAPEST!

Kurtz

HIGH TENSION MAGNETO

At the request of the Hess-Bright Mfg. Co, we have changed the name of our Magneto from Hess to Kurtz.

LATEST—Because it is.

BEST—Because we can produce a *hotter* spark at a *lower* speed. Our *armature* has *improvements* not found on any other Magneto. Has *one-third* less parts than any other Magneto, which means simplicity and of course increases reliability. Constructed under our *original* patents, by which method we can reduce the number of parts as well as increase the efficiency,

CHEAPEST—Because it stands higher in efficiency and reliability. We can *afford* to sell cheaper not by giving you something inferior, but can do it only by using our *patented construction*, and reducing the parts and complications to a minimum.

We have the largest line of Magnetos on the market. We *actually* sold more Magnetos for 1908 than any other concern. A strictly American product, guaranteed to have the efficiency and quality of the best on the market.

We are offering nothing freakish. Built on established principles. Efficiency and durability our one aim.

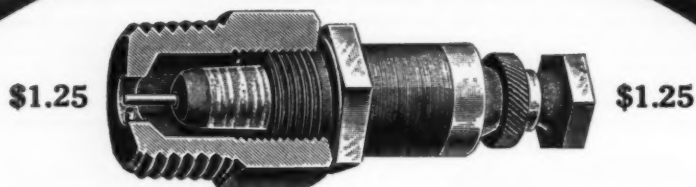
HERCULES goods sold absolutely on their merits. Write Dept. "T. A."

Hercules Electric Company

INDIANAPOLIS, INDIANA, U. S. A.

"COMET"

SUREST IGNITION



Manufactured by THE OAKES & DOW CO.
15 CHARDON STREET, BOSTON, MASS.

OUR CLAIMS

which have been proved true by all manufacturers, jobbers and users who have used them for past five years

NEAREST SOOT PROOF

THE STRONGEST MADE

Only Perfect Lengthwise Mica Insulation
The Largest Record in Races and Endurance Runs
The Most Expensive Made. Strongest Patent
No Other Insulation Like It in World
Used by Best Manufacturers
Have Stood Behind Every Plug
Only Manufacturers Who Have Held Same Price
For Past Four Years



Perfectly Gas and Pressure Tight

"SOOTLESS"

AUTOMOBILE CATECHISM

For the Use of Owners and Drivers
of Cars Fitted with Internal
Combustion Motors

BY

FORREST R. JONES, M.E.

Principal of the Manhattan Automobile School

AN indispensable companion for all who own or drive automobiles. It is written in simple language and in question and answer form, so that by the aid of a complete cross index the autoist can get immediate help in time of trouble. Where necessary, diagrams will illustrate the text.

The AUTOMOBILE CATECHISM is pocket size and bound in real Morocco leather, which will wear indefinitely. Price, \$2.00, postpaid.

THE CLASS JOURNAL COMPANY
231-241 W. 39th St.
NEW YORK CITY

OWNERS OF AUTOMOBILES
SHOULD HAVE

Self-Propelled Vehicles

IN THEIR LIBRARIES

IT'S a new book by J. E. Homans, I.A.M.; tells the whole story. It explains in simple, non-technical language the mechanism and management of every type of automobile. 640 pages; 500 illustrations; complete diagrams; ready reference index. \$2.00.

ADDRESS

BOOK DEPT., CLASS JOURNAL CO.
231-241 West 39th Street, New York

AUTOMOBILE RECORD

By SIGMUND KRAUSZ

EXPENSE account for fifty-two weeks, with columns for cost of gasoline, carbide, kerosene, repairs, replacements, daily runs, chauffeur's salary, garage expenses, speed record, starting point, destination, motoring laws of thirty-five States and names of others having no laws. Totals of expenses and runs for any period shown at a glance.

MOROCCO COVER, ONE DOLLAR

The CLASS JOURNAL COMPANY
231-241 West 39th Street, New York

WESTON ELECTRICAL INSTRUMENT CO.

Electrical Measuring Instruments

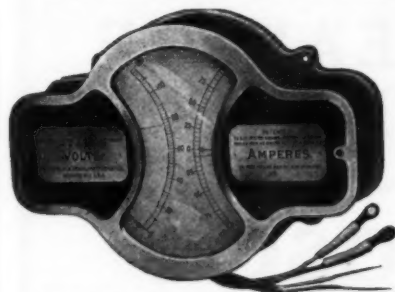
FOR USE IN

Electrical Carriages and in Charging Stations

Send for Catalogue

Main Office and Works, Waverly Park, Newark, N. J.
New York Office, 74 Cortlandt Street

London Branch: Audrey House, Ely Place, Holborn.
Paris, France: E. H. Cadot, 12 Rue St. Georges.
Berlin: European Weston Electrical Instrument Co., Ritterstrasse, No. 88.



Combination Volt and Ammeter Model 30



Switchboard Instrument Model 130

Packard Ignition Cable

Finest Rubber Insulation protected by whip cord braids and an elastic enamel coating. Every foot tested to twenty times required voltage by our patented process

HEAT, OIL, GREASE AND WATERPROOF

THE PACKARD ELECTRIC COMPANY, 302 Dana Avenue, Warren, Ohio



THE GREAT WHITE LIGHT MAKES DAYLIGHT AT NIGHT

Willard Storage Batteries
AND
Tungsten Lamps

THE WILLARD STORAGE BATTERY COMPANY
CLEVELAND, OHIO

★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★

THE WISE MEN OF THE EAST
THE WISE MEN OF THE WEST

USE THE

Reliance

SPARK PLUGS

"THEY SPARK IN WATER"

YOU TRAVEL FAR YOU TRAVEL GOOD

JEFFERY-DEWITT CO.

222 - HIGH ST. NEWARK, N. J.
SEE OUR EXHIBIT AT BOTH NEW YORK SHOWS.

★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★

"You Screw the Battery In—We've Done the Rest"



Steel Battery Box

ADMITTEDLY the BEST Battery Equipment for a Car, BECAUSE

- 1st—No binding posts or wires—setting up or renewal of battery as easy as an incandescent lamp—in fact, done in the same way!
- 2d—Connections can't jar loose! Contacts positive and instantly made. No binding posts or wires.
- 3d—Moulded rubber composition plate over rubber gasket waterproofs batteries absolutely!
- 4th—Automatic bridge in each receptacle permits removal of an exhausted cell without interrupting circuit.

You'll not bother with Storage Batteries after you've seen this battery set. It's IDEAL! Each unit renewable even with your gloves on. The most-talked-of invention in the electrical field. Send for Bulletin "62"

STANLEY & PATTERSON, 23 Murray St., New York

"Columbia," "Eastern," "Nungesser 1900," "Stackpole," "Red Seal," "Hi-up," "Mesco," and other makes of Batteries now furnished in this "Screw Top" Pattern. Just specify "Screw Top" in place of old Binding Post type of cell.



Mahogany Battery Box

THE HOYT

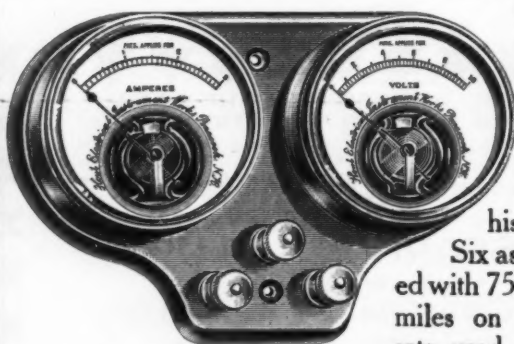
**ELECTRICAL
INSTRUMENT WORKS**
Penacook Station, N. H.

SPECIALTIES

For 1909

The Hoyt System of Testing Ignition deserves your careful consideration when choosing your 1909 equipment: first, because it enables you to increase the efficiency of your motor; and second; because it diminishes the cost of operating your Auto or Motor Boat by saving your gasoline, batteries and coils.

A leading Banker of Tennessee writes us that



he made 1025.3 miles on a set of 6 Columbia Dry Cells in his Stevens

Six as compared with 75 and 250 miles on the two sets used previous

to installing the Hoyt System.

A prominent official of the Virginia Polytechnic Institute writes: "I received the 225 Voltammeter, and found it a fine instrument. It was no time in showing me that one of the units in my coil was about broken down."

We have received hundreds of letters of similar character. Can you afford to overlook such testimony?

The Triune is a Pocket Voltammeter made for those who appreciate quality.

Bulletin A describes both of these.



A YEAR OF TRIUMPH FOR Bosch Magneto

ON THE TRACK

Bosch won the French Grand Prix—The Prince Henry Contest—The Grand Prize at Savannah—The Light Car Event at Savannah—Both Brighton Twenty-Four Hour Races. Nazarro established the World's Record (120 miles an hour) with a Bosch. Many minor events were also won with this system.

ON THE ROAD

The Thomas car won the New York-Paris Race with a Bosch. The winning cars in the A.A.A. Touring Contest were equipped with a Bosch. T. K. Hastings completed the Six Day Reliability Trial (Auto Cycle Union of England) with a Bosch.

IN THE AIR

Zeppelin's Great Dirigible Airship used two Daimler Motor Engines equipped with a Bosch.

ON THE WATER

Dixie II, winner of the International Trophy in the greatest Motor Boat Race of the year, was equipped with a Bosch.

ON THE MARKET

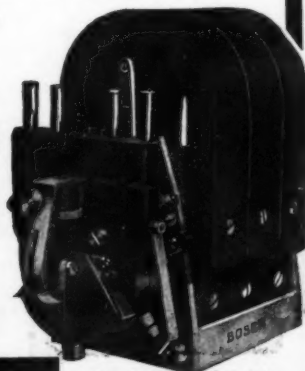
The Bosch is recognized as the Best Ignition System obtainable, and it is found on the majority of cars all over the world.

Order a Bosch *now* for your car.

Bosch Magneto Company

223-225 West 46th St.
NEW YORK

CHICAGO BRANCH
1253 Michigan Ave.



HIGH-TENSION =VOLTA=



THE GUARANTEED MAGNETO

We guarantee the Volta Magneto as a perfect ignition system in itself and we expect the user to hold us absolutely to our word. In efficiency, simplicity and accessibility the Volta stands alone.

WITHERBEE FOR IGNITION

Wico Charging Device Wico Spark Plugs
Wico Ignition Wire Witherbee Batteries
Wico Inspection Lamp

WITHERBEE IGNITER COMPANY

1876 BROADWAY, NEW YORK

Makers of the famous Witherbee Battery

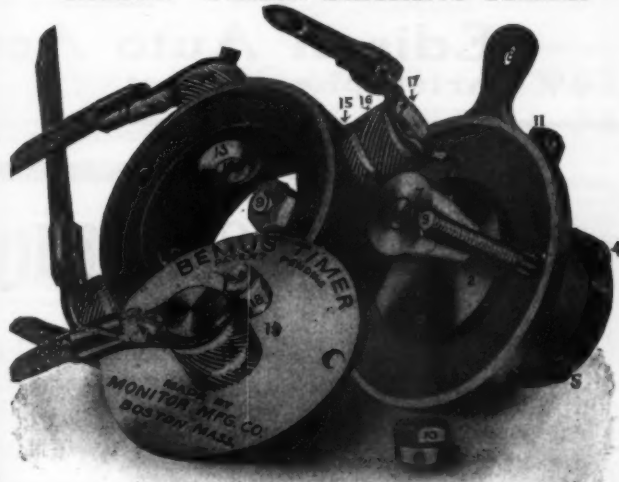
Chicago: 1429 Michigan Avenue Detroit: 220 Jefferson Avenue
Buffalo: 43 East Eagle Street Baltimore: 604 Continental Bldg.

IMPROVED MONITOR DISTRIBUTER

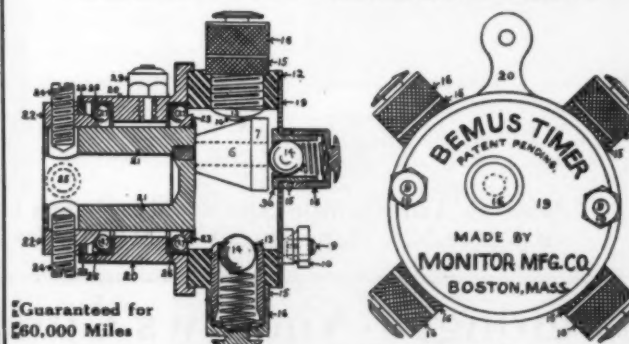


IN A CLASS
BY ITSELF

"BEMUS" PLAIN BEARING TIMER



"BEMUS" BALL BEARING TIMER



Guaranteed for
250,000 Miles

SEND FOR BOOKLET

MONITOR MANUFACTURING CO.
1425 Washington Street BOSTON, MASS.

SPECIAL OFFER

EDISON

Spark Plugs

One year's supply for your Motor Boat or Automobile, for

One cylinder engine	-	-	\$1.75
Two cylinder engine	-	-	3.50
Three cylinder engine	-	-	5.25
Four cylinder engine	-	-	7.00
Six cylinder engine	-	-	10.00

If you enclose the amount required with your order, we will send the number of plugs desired and keep you supplied with these plugs for one year from the date of your order.

If you desire the double system plug add two dollars to the above amounts.

This is, without exception, the greatest spark plug offer ever made, and everybody should take advantage of this proposition. We will be at all shows.

Edison Auto Accessories Company
49 Christopher Street, New York



Send for this book on Ignition. Mailed free. Ask for Book K.

Boston Automobile Show, March 6th to 13th
in Space 523, Department F, Mechanics Bldg.

Pettingell-Andrews Company
BOSTON, MASS.

Exclusive Selling Agents for JACOBSON-BRANDOW COMPANY of
Pittsfield, Mass.
General Offices and Warerooms, Cor. Pearl St. and Atlantic Ave., Boston, Mass.
Branch Office, 327 Jefferson Ave., Detroit, Mich.

Simplicity Economy Reliability

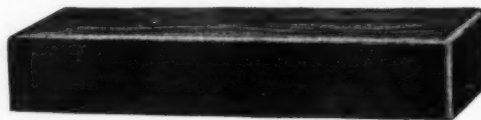
Features of J. & B. COILS and
IGNITION SPECIALTIES

NEW TYPE J COILS—ABSOLUTELY FOOL PROOF

Free Trial Offer

¶ We will furnish samples for test to responsible parties. Send for our 30-day trial offer.

¶ A complete working exhibit will be shown at the



Type J-4 Coils with New "Fool Proof" Vibrator

IGNITION RELIABILITY

is, in the last analysis, simply the ability to *keep going*, coupled with ease of repair and adjustment when wear occurs.

But how long should it "keep going," and what degree of ease in repair is requisite? The standard of Ignition Reliability in the past has been very moderate; and to spend an hour or two a week on the various ignition elements has not seemed unreasonable.

The time is coming when the ignition system will be required, in any reputable car, to do its work with as much uniformity, as little demand for tinkering, adjustment and expert skill, as the valves or the ball bearings.

That is the sort of reliability which users of the Atwater Kent Spark Generator are learning to expect of *their* ignition system—and they are getting it.

The Atwater Kent Spark Generator is a high-tension ignition apparatus for multi-cylinder engines. It has a positive mechanical make-and-break, so designed as to run for years without appreciable wear. The moving parts are exceedingly light, and are glass-hard. One spark is made per ignition, and the duration of contact—regardless of the engine speed—is as short as will permit the coil to "build up." Six dry cells last 1500 to 2000 miles. The coil, distributor, spark advance and cylinder cut-outs are as carefully worked out as the contact maker.

Atwater Kent Manufacturing Works 44 NORTH SIXTH ST. PHILADELPHIA, PA.



CONNECTICUT

IF it's a COIL (1, 2, 3, 4 or 6 Cylinder), Distributor, Timer, Terminal, Coil Current Indicator, Ammeter, Switch or Exploring Lamp, we have them in Quality a little better than the best

SEND FOR CATALOG 13-B

CONNECTICUT TELEPHONE AND ELECTRIC CO.

50 Britannia Street MERIDEN, CONN.

Isn't it better to equip your cars right at the start than to wish you had later on? For instance: isn't it a good, smooth business notion to keep your car free from a complication of wiring and fussy parts? Isn't it better to use a distributor and timer with one coil, than 'tis to use four coils with all of the incident additional wiring and additional chances for trouble? Isn't it better to use

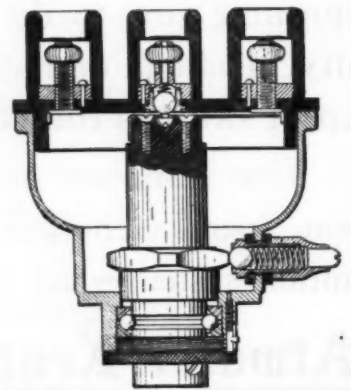
The Leavitt Distributor

and be sure of absolute operation on your cars, than 'tis to experiment and fool with things that are known and proven wrong in design and principle?

Many of the makers of cars, both here and abroad, are using

The Leavitt Distributor

and the sole and only reasons why are: The LEAVITT is absolute in operation; it has one coil with iridium points; it will work on 1-4 to 1-2 amperes and will not work on over one, so contact points cannot get burned; it will never skip a spark no matter what the speed and it requires no constant tinkering and adjustment. Your own business sense should lead you to an immediate investigation of THE LEAVITT. It will do you no harm to know about it and the chances are that you'll be put in a way to the betterment of your cars, you never dreamed of. Will you start an investigation to-day? What's the use in the putting off of getting next to a good thing?



The Uncas Specialty Company

13 Shipping St., Norwich, Conn.

1691 Broadway, New York



YOU WHOSE LIVING COMES THRO' THE SALE OF AUTOS AND AUTO SUPPLIES

(Straight from the Shoulder Talks—No. 1)

You're in business presumably—as some of the rest of us are—for what's in it. Granted. Now comes the question, "Are you getting all you should out of the business, and if you're not, why not? Whose fault is it?" What's your idea of business anyway, profit per or profit aggregate? Rather, make a big profit per with a few pers or go off a little on profit per and come in strong on profit aggregate. If it's a matter profit per you'll never work it out, not in 110 years; it's been tried and 'twas all to the bad. Here's one way to try it out if you've got to be convinced with a bang: A customer comes to you and asks for a "Neargood" Spark Plug. Don't put him wise, don't point out to him that he's stuck. Let him come across with his cash because there's a big profit per in "Neargoods" and let it go at that. Now listen! Does the customer who becomes wise to having been stuck come back for more "Neargoods"? Nothin' doin'. That's all—easy example of per profit. Where do you get off? Where do you stand to win? You've got one fat per profit and one quit customer. Don't tell us.

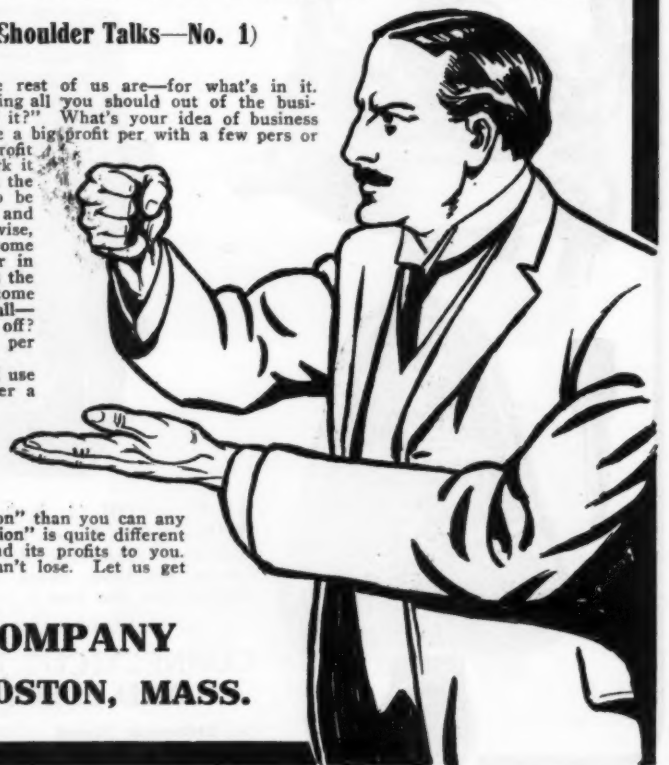
Now if you had advised the customer to buy and use the Champion Spark Plug you would not only garner a profit worth while, but you would have created a medium thro' which other sales would surely come, just because your customer would pass the word that the Champion was best of all spark plugs and worth having. Now we want you, Mr. Dealer, to handle the "Champion"; we want you to handle the "Champion" solely for your own

profit. We tell you that you can make more money in selling the "Champion" than you can any other, and we stand ready to back and prove this to the limit. The "Champion" is quite different from other spark plugs and in the difference lies its value to the user and its profits to you. Let us tell you all about it; let us make you a proposition on which you can't lose. Let us get together right now. Write to-day.

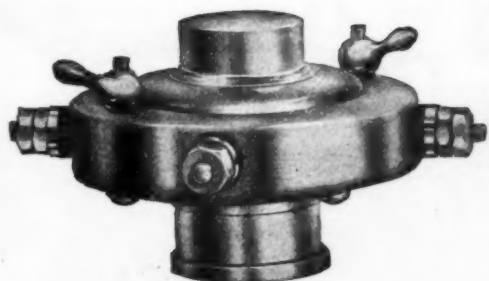
THE ALBERT CHAMPION COMPANY

36 Whittier Street

BOSTON, MASS.



KINGSTON



**SPARK COILS
SPARK PLUGS
TIMERS**

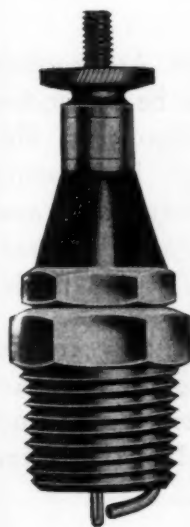


**Larger Output—Lower Cost for 1909
1,000 Coils a Day**

Will be our capacity for the next year. This immense output means great reductions in cost of manufacture and a still greater reduction of the selling cost, since every sale of KINGSTON goods sells more without any expense—the high quality of our goods makes friends everywhere—to try them is to use them and to use them once is to use them regularly. The great reduction in cost of production, together with economy in selling end, entitles the user to greatly reduced prices; therefore a new list price for 1909 has been arranged, showing greatly reduced prices on the entire line of KINGSTON IGNITION SPECIALTIES

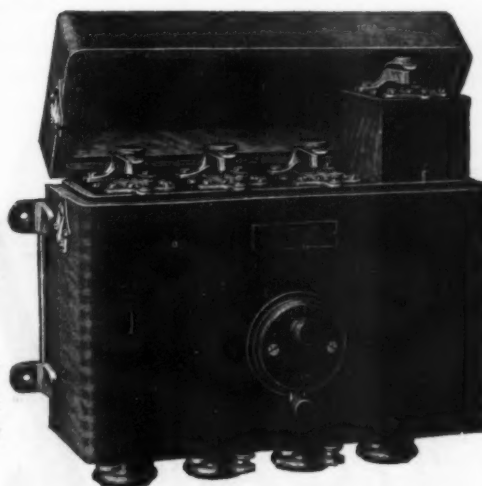
The KINGSTON line includes Spark Coils for every purpose; Dash Coils; Plain Box Coils; Magneto Coils, specially fast; Motorcycle Coils; Make-and-Break Coils; Mica Spark Plugs, and Timers, all high grade, but at prices based on a reasonable manufacturing cost. The

**KINGSTON Line is RIGHT
High Grade
Reasonable in Price**



It is easier to sell a high-grade article at a fair price than a high-grade article at a high price or a low grade article at any price.

We want live dealers in every city and town to handle our goods. Write for new quotations and full information. Booklet descriptive of the entire line for the asking.

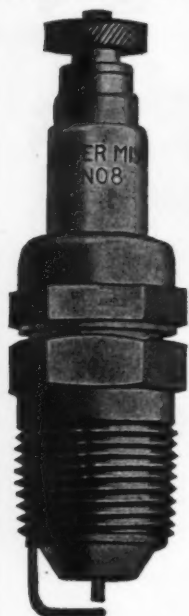


SEE OUR
EXHIBITS

New York: Dec. 31-Jan. 7, Grand Central Palace, Space 154
New York: Jan. 16-23, Madison Square Garden, Space 157
Chicago: Feb. 6-13, Coliseum Gallery, Space 75

KOKOMO ELECTRIC CO. P. O. BOX 207 Kokomo, Ind.

A MAKER'S
NAME does not make



\$1.00 Each
Any Thread



a \$2.00
Spark Plug but
the \$2.00 value
makes a model

\$1.00 PLUG

Never-Miss No. 8 is the \$2.00 value
AT THE DOLLAR PRICE

Our Guarantee

We guarantee this Plug for one year's
actual service against any defects or
broken porcelain, replacing same free.

MAGNETO PLUG, SAME PRICE

MICA PLUGS, Any Size, \$1.00 Each

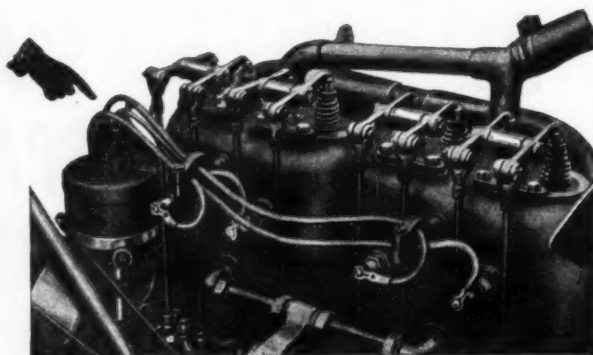
Dealers make more profit on the com-
mon dollar plugs, but don't take a lemon
—insist on NEVER-MISS No. 8, and a
year's wear. Prepaid if he won't supply you.

THIS IS THE DAY—DON'T WAIT

Never-Miss Spark Plug Co.
LANSING, MICHIGAN

The American Igniter

is a coil, timer and distributor in one to be
mounted directly on your timer shaft. In-
fallible in its action, owing to a positive
electrical and mechanical principle.



Made to fire one to six cylinders. Our
pamphlet tells why it is heat and moisture
proof, why it fires all mixtures without
missing or frequent readjustment. There
are many more reasons why it is best to use.

WRITE US FOR ATTRACTIVE PRICES
AND THE AMERICAN IGNITER STORY

AMERICAN ELECTRIC FUSE CO.

Muskegon, Mich.

New York, N. Y.

THE AUTOMOBILE TRADE DIRECTORY



"It
Hangs
Everywhere"

The Recognized Directory of the Automobile
Industry and the only one that Can be Depended
Upon. Constantly referred to by Managers, Me-
chanical Engineers, Superintendents, Purchasing
Agents, the men who *specify* and *buy* parts and
material for the construction of cars, and by Deal-
ers, Garages, Supply Jobbers, and the entire trade.

Its sole purpose is to tell the buyer *who* makes
the thing he wants, and the arrangement of our
classified lists presents the advertiser's name and
announcement to the purchaser just when the latter
wants the identical thing advertised.

If your advertisement is not appearing in its columns it
will pay you to investigate our proposition. **WRITE US**

THE AUTOMOBILE TRADE DIRECTORY

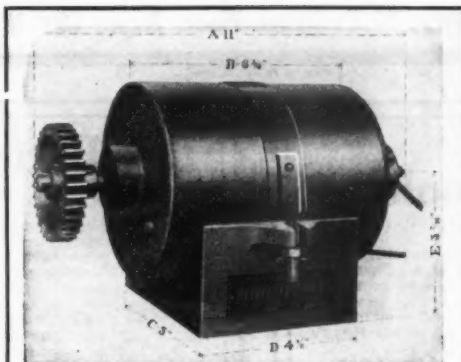
231-241 WEST 39th STREET, NEW YORK

HEINZE IGNITION APPARATUS



Standard ALAM
7/8"-18 thread

HEINZE
IMPROVED
MICA
SPARK
PLUGS



Heinze Low Tension Magneto operating
through vibrating coil to spark plug.

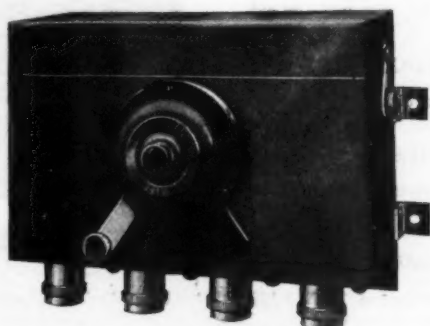
HEINZE
IMPROVED
MICA
SPARK
PLUGS



Regular 1/2"-14
Pipe Thread



Showing Magneto disassembled.



Our latest type coil supplied with kick switch
for operating either on Magneto or Battery.



Our latest type of timer with our improved
wipe contact, acknowledged by all leading
Motor Car Makers to be the most superior
type of construction.

HEINZE ELECTRIC COMPANY

Send for our latest catalogue.

Factory and main office, LOWELL, MASS.

WARNING !

After January 1st, 1909,

A RED SEAL

will be attached to the outside of

ALL IGNITION COIL UNITS

made under our patents and sold by our licensees.

THE UNLICENSED

Manufacturers, Users or Vendors

WILL BE PROSECUTED.**THE UNIT COIL CO.**

Address license application to the Secretary, 15 Exchange Place, Jersey City, N. J.

SEAL

(COPY)

**The
Automobile Pocketbook**

By E. W. ROBERTS, M.E.

This is a very complete little book, dealing with the automobile in its modern forms. It was written by a practical man for practical men, and contains a great deal of valuable information. The style in which The Automobile Pocketbook is written is concise and to the point, there being no unnecessary verbiage, so that although small in size, the volume will be much appreciated by those looking for real practical information. It is one of the best pocket-books.

Size, 3 1-2 inches by 4 1-4 inches. The book contains 319 pages, many interesting illustrations, and is carefully indexed. Bound in leather, charges prepaid, \$1.

Address: **THE AUTOMOBILE,**
231-241 W. 39th St., New York.

Dry Batteries

By NORMAN H. SCHNEIDER

A thoroughly practical and lucid volume on the construction and use of dry cells of any shape and size with special application to automobiles and launches; gas engines of all types; medical coils; bells and burglar alarms; or for other purposes requiring first-class dry cells. Anyone should be able to make dry cells from the clear, concise directions contained in this book, without the use of expensive appliances or tools. The instructions, together with the hints on the use of batteries, are given with the assumption that the reader is a novice.

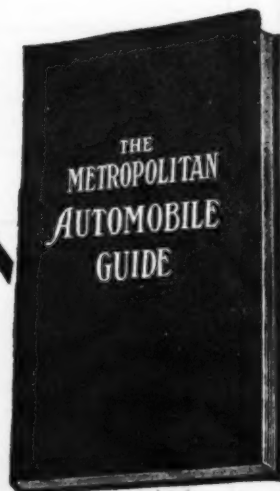
Size 4 3-4 inches by 7 1-4 inches, 59 pages and numerous illustrations.

PRICE: Paper Bound, delivered, 25 cts.

Address: **THE AUTOMOBILE,**
231-241 W. 39th St., New York.

**THAT'S
IT****The Metropolitan
Automobile Guide**

Actual
size
5 1/2 x 9 1/2
inches



A special volume you must have if you live in or within a hundred and fifty miles of New York City. No matter what question or routes arises you can turn to this book and **KNOW** it will help you out of your difficulty quickly and with absolute accuracy. Suggests Seventy-four Round Trip Tours for those in doubt "where to go" and how "to get there" in an automobile.

74 COMPLETE ROUTES—EVERY ROUTE A ROUND TRIP

FROM and BACK TO NEW YORK CITY in sufficient variety to cover any section of the country in any way, with State lines practically ignored.

6,737 1/2 MILES OF ROADS,—382 PAGES

Accompanied by City Diagrams and Route Maps, together with best accommodations in Hotels and Garages. Exact mileage given for every town and every turn and landmark on the routes.

FULLY ILLUSTRATED AND DESCRIBED BY TEXT

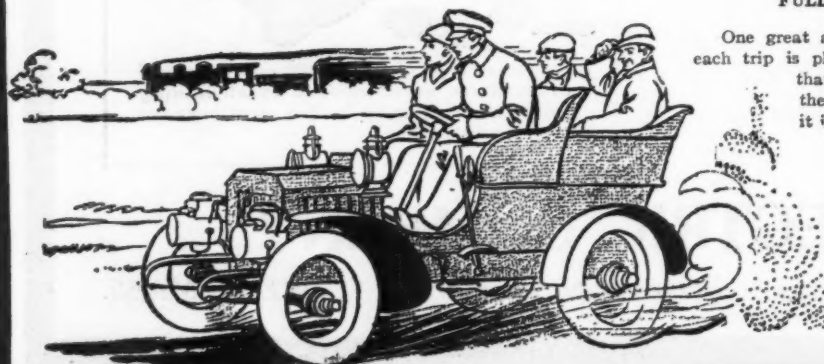
One great advantage of THE METROPOLITAN GUIDE is that each trip is planned throughout for the Autoist so clearly and precisely that he can easily travel without asking a single question; at the same time, by merely setting his odometer to correspond, it is possible to pick up the route at any intermediate point.

**BOUND IN GENUINE LEATHER
PRICE, \$2.50 PREPAID**

For sale at all leading Book Stores, Garages, and by
the Sole Publishers

The CLASS JOURNAL CO.

231-241 West 39th Street
NEW YORK



BLISS COILS



*Our Watchword
is Quality, not Price*



We are Storage Battery manufacturers, and have been compelled in self-protection to bring out the most efficient spark coil that it is possible to produce.

We have incorporated in our coils the following features (most of them exclusive), which [are incompatible with cheap construction:

Fool-proof Tor-sional Vibrator (patents pending). Operates on 1-10 of an ampere.



Iridio-platinum points. Iridium costs \$100 per oz.

Secondaries] wound layer for layer with insulation between each layer. Hard Rubber Unit Cases. Combination Magneto and Battery Switch for foot operation.

See our exhibit in Space F-367, and we will convince you

that you should insist on BLISS COILS on your car.

Licensed by the Unit Coil Co. and equipped with anti-induction shields.



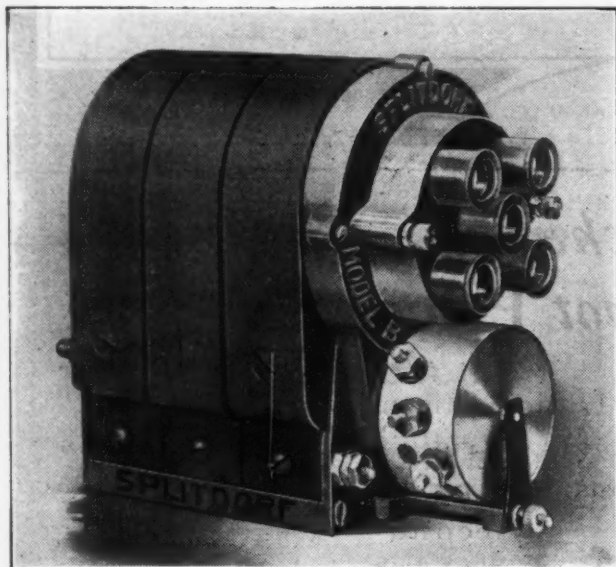
**FEDERAL MANUFACTURING COMPANY
LOWELL, MASS.**

Manufacturers of the Well-known REX IGNITERS

The Best Magneto Investment

IS A

SPLITDORF



Not merely because it is made by the oldest and largest ignition specialty firm in America, but **because of its real value as a Magneto.**

The motoring public recognize that the creative genius exercised and the infinite pains expended in **SPLITDORF** construction demand a somewhat higher price, but in proportion to value received the **SPLITDORF** is

The Most Moderate-Priced Magneto in Existence

Once and for all, it is the best that money will buy.

Fifty years of electrical engineering experience behind it.

Every part of this superb mechanism is of the most excellent material, and the construction is by the highest skill obtainable in America, embodying in every detail the most important improvement known in Magneto building. Its simplicity enables the inexperienced to install and adjust it without losing any of its efficiency. We emphatically claim it is the Most Scientific in Design, the Most Effectual in Operation, the Most Carefully Built of any Magneto extant.

Be sure to specify the **SPLITDORF MAGNETO** for your 1909 car. Being thus equipped you will be assured faultless ignition every day in the year.

Get our Magneto Catalog for detailed description

See our exhibit at the Grand Central Palace Show—Space 107K

C. F. SPLITDORF

Walton Avenue and 138th Street

Branch, 1679 Broadway

NEW YORK

Chicago:
319 Michigan Ave.

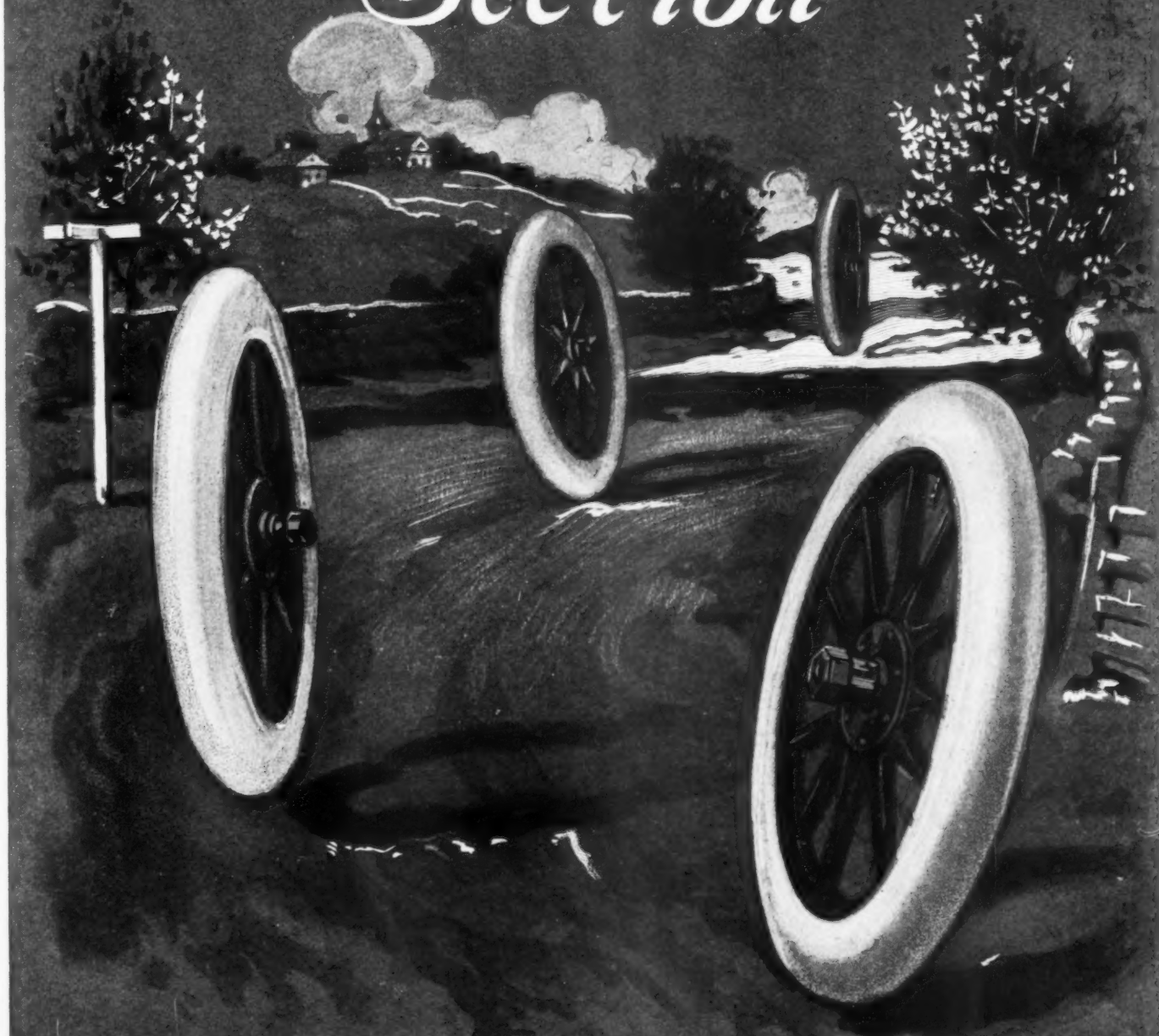
Detroit:
886 Woodward Ave.

Boston: Motor Mart,
220 Pleasant St.

San Francisco:
520 Van Ness Ave.

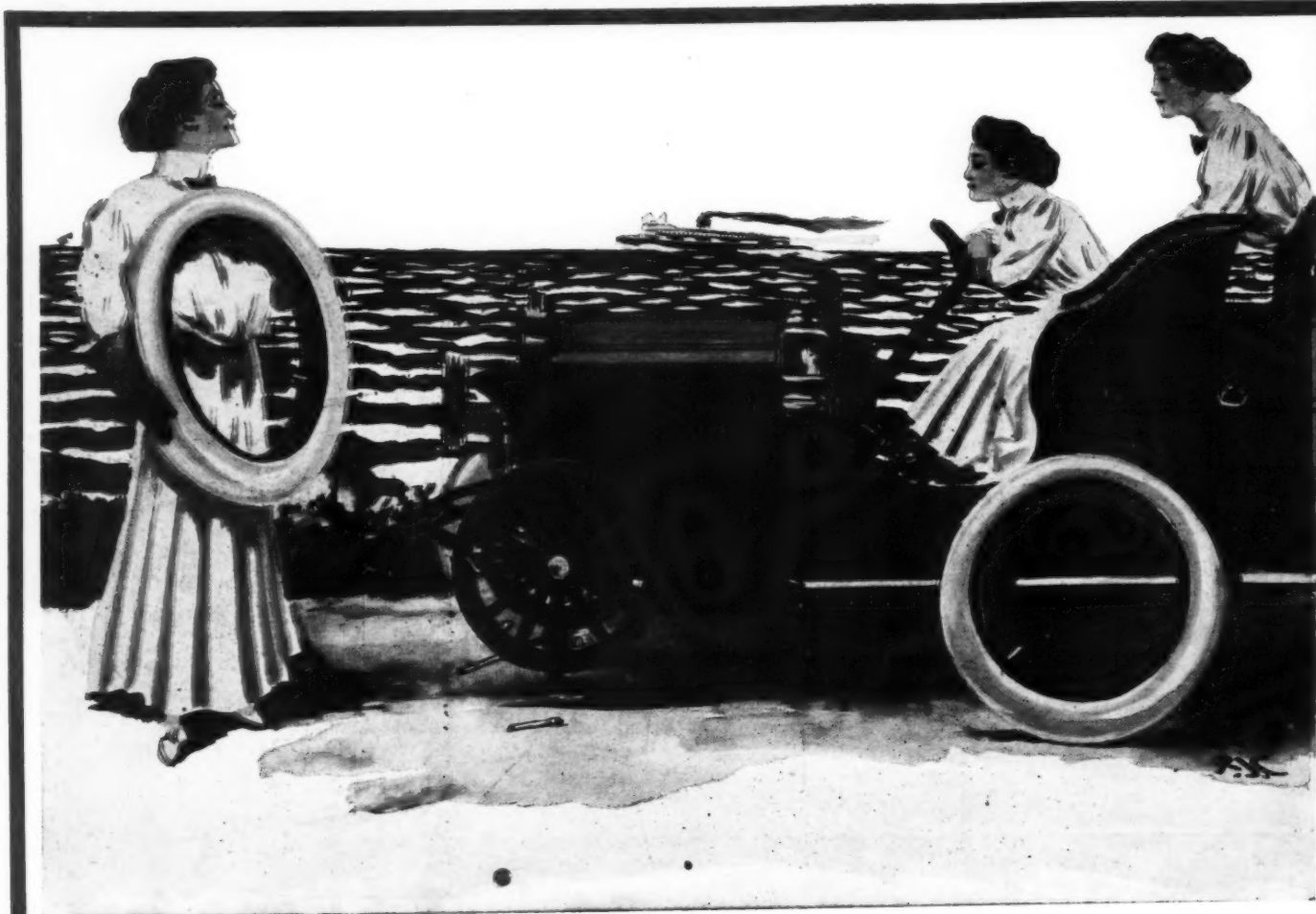


Wheel, Rim and Tire Section



INCLUDING

Pneumatic and Solid Tires, Wood and Steel Wheels, Hubs,
Caps, Bearings and Fittings.



A WOMAN CAN MAKE QUICK TIRE CHANGE WITH NADALL DEMOUNTABLE RIMS

THE operation is so simple and easy. Nothing is needed but a wrench to loosen or tighten four bolt-heads which release or clamp the felloe to your tire-rim. In five minutes the old tire is off and the new one in place. No need of fumbling in the dark or cold for nuts and other detached parts. There are no loose parts to a Nadall Demountable Rim. Nothing comes off but the tire and rim.

Only DEMOUNTABLE Rim used with a Quick DETACHABLE Tire

This combination is what people must have to avoid delay and trouble for tire trouble on the road. Clincher tires are a nuisance to handle. The detachable tire with a demountable rim requires no effort or mechanical skill and no tools but a simple wrench in the hands of anybody—man, woman or child.

See Our Exhibit at Madison Square Garden, New York, and Coliseum, Chicago.

How the Nadall Demountable Rim Works

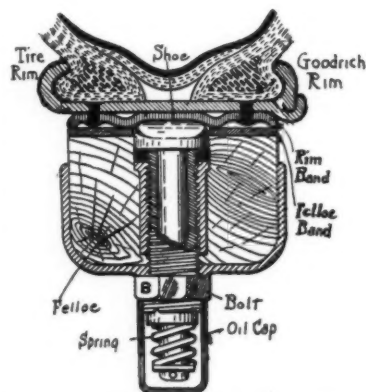
Two to four expanding shoes protrude through the felloe rim and fit into grooved depressions on the inside of tire rim. By applying a wrench to these bolt-heads the shoes are tightened or released without effort, and the rim quickly secured or released. So securely do these shoes hold that the wheel must break before they could be dislodged. The tire can thus be changed without detaching a single part. An oil cup on bolt-head serves to keep it in perfect condition.

Responsible Agents Wanted to Handle the Nadall Demountable Rim. Address

NADALL MFG. COMPANY

1225 Michigan Ave.

CHICAGO, ILL.





THE wheelmaker's art is as old as the hills. And there are a good many points in relation to wheels entitling them to more than passing notice. In the first place, the rim speed of a wheel of an automobile reaches the high maximum of approximately two and a half miles per minute. With the idea of illustrating just what this means, it is to point out that the rim speed on the flywheel on a 5,000-horsepower steam engine would be limited to one mile per minute. Wheels for automobiles must be nearly devoid of flywheel effect, and this is an extremely difficult matter, unless the felloes are of wood and of small section. Fortunately, wood exhibits rare qualities under the condition in which it is used in wheels, and the felloes and spokes can be of small cross-section without trespassing upon the desired factor of safety.

The Camber in Wheels.—The better grade of wheels are provided with at least ten spokes for the front and twelve spokes for the rear and the spokes are set at an angle, giving a "dished" effect. This is not with a view to enhancing the appearance, but with the idea of enormously increasing the ability of a wheel to sustain against side strain. The amount of camber given the wheels is enough so that the spokes are appreciable longer than the radial distance from the hub to the felloe. Because of this distance and its influence, a wheel cannot be "dished" by an outside force out of the plane it is given at the time of its construction unless the rim and the felloe part. The reason for this lies in the fact that all the spokes are in compression and all share the responsibilities equally. It is not necessary, then, to have spokes of large section and great weight, whereas, on the other hand, resiliency is imparted to the wheel if the spokes are not of such great section, especially if they are whittled down in such a way as to make them rigid in the sheer plane only. This year's cars have decidedly improved wheels, both as respects the design and in that the diameters are greater than they were in the past. There never was any question as to the undesirability of some of the low diameter wheels used in the past. The wheels lacked resiliency and the tires used were too small to do the work. These matters have been corrected very largely and an attempt is being made to maintain the high standard of second-growth hickory, long the standard wood for wheel-making, and now growing more scarce year by year, thus introducing a considerable wheel problem. This is one of the reasons why steel wheels are used quite extensively, although it is true that steel "disc" wheels are chosen for their great strength, as well as the fact that the service in which they are used demands heroic treatment. Indeed, it is a question if steel wheels may not become very popular in the near course of events.

Hubs in Modern Wheels.—The trend is entirely in the direction of ball and roller bearings for wheels and the hubs are accurately machined from steel castings or die forgings, as the case may be. Provision is made for keeping the lubricant within the hub cavities so that the ball or roller bearings are profusely lubricated. Hub flanges are wide and a suitable number of bolts of good diameter are used to bolt the woodwork into secure relation. There is decided tendency also to have the spokes at the miter very accurately fitted and fastened by glue, so that it will be readily feasible to dissemble the wheels at any time for whatever purpose as, for illustration, a new

hub might be substituted at will for one damaged in service.

Something About Rims.—While the clincher type of rim has been long and favorably regarded, the fact remains that the average autoist rarely feels capable of coping with the tire trouble that might arise because of the difficulties involved. Demountable rims came into vogue because there was a demand for means by which tires could be changed by men of ordinary strength under unfavorable conditions. The demountable rims are, apparently, just as secure as the clincher type, and certainly it is much easier to change tires if demountable rims are used. At the present time rims are made of the finest grades of materials and the joint is rendered strong by the electrical welding process. There are several schemes by which the demountable feature is rendered practicable, and experience rather goes to show that any choice is purely as a personal matter.

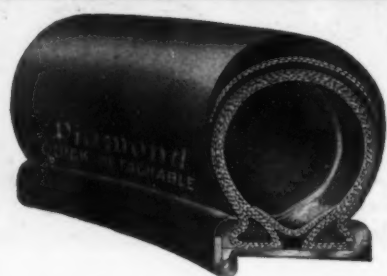
Improvements in Tires.—The first great improvement in the tire situation came by way of a reduction in price, thus enabling builders of cars to use wheels big enough for the purpose. It would not be far fetched to say that the smallest run-about would have tires as big as we find on the largest touring car to-day, price permitting. The life of a small tire on a big car, in which speed and weight are considerable factors, is too short to be regarded from a commercial point of view. If larger tires are being used at the present time it is also a fact that experience has lent zest to the undertaking and the quality of tires is on a higher plane.

A visit to the tiremakers' plants would show the use of better materials, a more discriminating selection of rubber and refinements in the progress that can only end in better tires. These same refinements and the quickening of the process were, of course, largely responsible for the cut in price, which cut, in turn, as before stated, enable builders of cars to select tires big enough for the purpose. Tires are made in the several well-known standard sizes; they nearly all seem to be of the wrapped tread variety and the non-skid feature is properly cared for just as in the past.

Use of Solid Tires.—Of solid tires and the special forms of rubber tires now much in use a book could be written extolling their well-known virtues and the last word would not even then be said. In trucking work to do without the "solids" would be equal to choosing to do without the trucks. It is quite out of the question to maintain the present pace with trucks considering the use of anything but solid tires or special forms of tires of rubber independently of the well-known pneumatic tires excepting in special cases.

Tire-Filling Compounds.—In certain classes of work the pneumatic tires are filled with a compound instead of air. It will not be possible at this time to discuss the compositions in detail more than to say that they do serve a very useful purpose, and it is due to their use that automobiles are regarded as much improved by the utilization of the compounds in certain classes of service in particular.

Run on Ball and Roller Bearings.—The old types of plain artillery hubs are no longer to be seen. Ball and roller bearings have proven their worth, not only because they "slay" friction, but by reason of endurance as well. The types of bearings available are in such great profusion as to render discussion here futile unless to reiterate their fine qualities.



Foremost Diamond Wrapped Tread Tires

Pre-eminently in first position in service, satisfaction and number used. Logically constructed from the beginning, their advance in efficiency has been logically worked out.

With more of our tires in service than have any other two manufacturers combined, we have had by far the most comprehensive field for the judgment of results. To the utmost this advantage has been used.

"A better tire for 1909 than you have ever used."

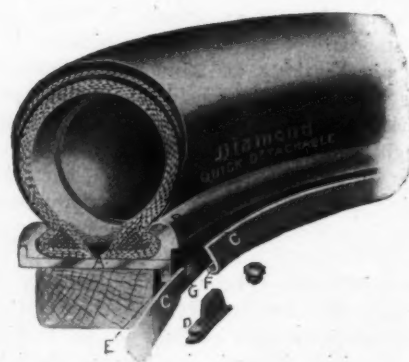
Diamond Demountable Rims

For Inflated Extra Tires

The simplest, quickest, best. Absolutely secure and absolutely safe



The MARSH
Quick-Acting
Clincher Rim
100 Per Cent. Efficiency



The Diamond Rubber Co.
Akron, O.

Salisbury Wheel and Manufacturing Co.

AUTOMOBILE WHEELS AND AXLES

Jamestown, N.Y.

The Thomas-AMERICA'S CHAMPION NEW YORK TO PARIS RACE



The Only American Car Entered
Buffalo, N.Y.
10/30/08

Salisbury Wheel & Mfg. Co.,
Jamestown, N.Y.

Gentlemen:-

The Thomas car driven by me, and winner of the New York to Paris race, was equipped with Salisbury Wheels, not specially constructed, but the same wheels which you had been furnishing for all Thomas Flyers, and I think you will have to go a long way before you will find a test which will give your wheels as great punishment as was experienced in that long and difficult journey.

Roads of every description were encountered, and when you stop to think that the car traveled over thirteen thousand miles under its own power, through snow, mud and swamps, fording streams, climbing mountains, and worst of all bumping over four hundred and fifty miles of cross ties in Siberia, you will see for yourself how they have been treated.

Notwithstanding this tremendous usage, I am pleased to say that there was no breakage of or trouble with the wheels whatsoever, and the wheels now upon the car are those which carried me safely to victory, and are in condition which would apparently permit them to do the trip over again. You are to be congratulated upon the performance of your product.

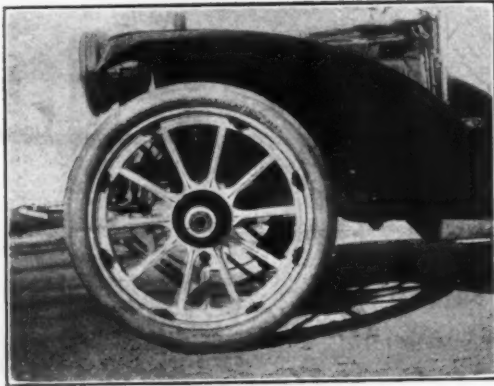
Yours very truly,

George Schuster

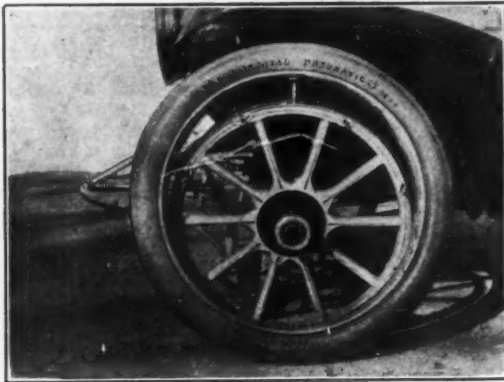
Driver of the Thomas Flyer in

New York to Paris race.

Continental Ready-Flated Tires



1—Ready-Flated Tire in Position on Wheel



2—Ready-Flated Tire Partly Removed

Permit the
carrying of tires
already
Inflated
on
Spare Rims

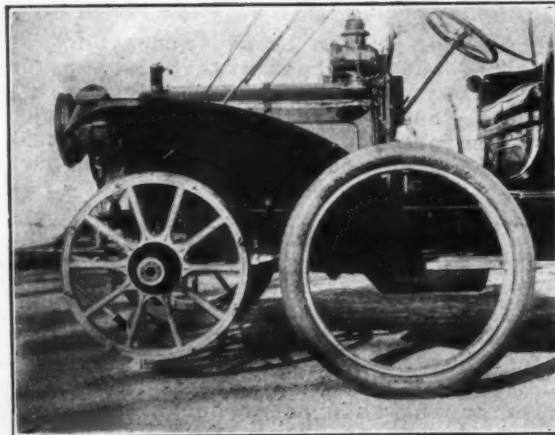
Reduce
Tire
Expense
and make
motoring
a
Pleasure



5—The Finishing Touch



4—Placing Ready-Flated Tire on Wheel



3—Wheel Fitted to Receive Continental Tire—"Ready-Flated"



H

Re-
turn this
coupon and
we will send
beautiful booklet

Name.....
Street.....
City.....
State.....

Continental Caoutchouc Company

J. M. GILBERT, General Manager

1788-90 Broadway

New York City

Branches and Distributing Agents in 18 Cities.

DEALERS EVERYWHERE.

Continental Ready-Flated Tires

THESE popular tires with Continental Demountable Rims will be exhibited at both New York Auto Shows. Every car manufacturer in America recommends them as the most perfect and economical tire equipment when the carrying of spare tires, already inflated, is desired. Cheerfully demonstrated at all of our sales offices and orders filled three days from time wheels are delivered. We know you will want them on your new car, and to avoid delay you must specify early. Many present motorists are already "wise"—with them the fear of tire troubles is a thing of the past. Remember one investment only covers all expense—and any clincher tire and standard tube will fit. Our beautiful brochure "Continental Ready-Flated Tires" forwarded at your request.

Continental Caoutchouc Company

J. M. GILBERT, General Manager

Home Office: 1788-90 BROADWAY

NEW YORK CITY

BRANCHES:

Detroit, 226 Jefferson Avenue

SAN FRANCISCO: 422-4 Van Ness Avenue

DISTRIBUTING AGENTS:

Albany, N. Y., Albany Hardware & Iron Co.
Boston, Mass., The Post & Lester Co., 821 Boylston St.
The Post & Lester Co., 288-90 Devonshire St.
The Post & Lester Co., 16 Park Square
Brooklyn, N. Y., Martin-Evans Co., 1186 Bedford Ave.
Buffalo, N. Y., Centaur Motor Co., 59 Franklin St.
Chicago, Ill., Excelsior Supply Co., 237 Randolph St.
Chicago, Ill., Western Continental Caoutchouc Co.,
1438 Michigan Ave.
Cincinnati, O., Cincinnati Auto Co., 908 Race St.
Cleveland, O., Chas. E. Miller, 1829 Euclid Ave.

Hartford, Conn., The Post & Lester Co., 175 Asylum St.
Huntington, L. I., Sammis & Downer Co.
Minneapolis, Minn., Plant Rubber Co., 322 First Ave., North
New Haven, Conn., The Post & Lester Co., 1085 Chapel St.
New Orleans, La., Revere Rubber Co., 700 Baronne St.
Philadelphia, Pa., Jas. L. Gibney & Bro., 211 North Broad St.
Springfield, Mass., The Post & Lester Co., 125 Bridge St.
St. Louis, Mo., Neustadt Automobile & Supply Co.,
3948 Olive St.
Toledo, O., Acme Rubber Co., 925 Jefferson Ave.

REPRESENTATIVES EVERYWHERE YOU MOTOR

Re-
turn this
coupon and
we will send
beautiful booklet

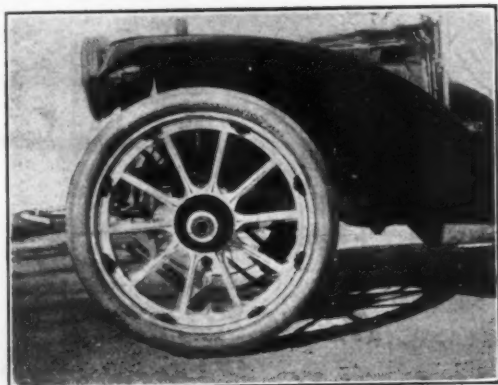
Name.....

Street.....

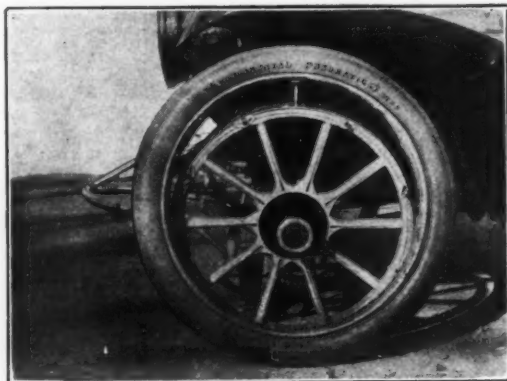
City.....

State.....

Continental Ready-Flated Tires



1—Ready-Flated Tire in Position on Wheel



2—Ready-Flated Tire Partly Removed

Permit the
carrying of tires
already
Inflated
on
Spare Rims

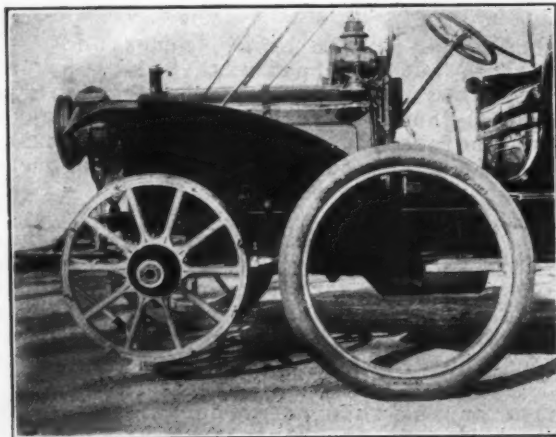
Reduce
Tire
Expense
and make
motoring
a
Pleasure



5—The Finishing Touch



4—Placing Ready-Flated Tire on Wheel



3—Wheel Fitted to Receive Continental Tire—"Ready-Flated"



H

Re-
turn this
coupon and
we will send
beautiful booklet

Name.....

Street.....

City.....

State.....

Continental Caoutchouc Company

J. M. GILBERT, General Manager

1788-90 Broadway

New York City

Branches and Distributing Agents in 18 Cities.

DEALERS EVERYWHERE.

Continental Ready-Flated Tires

THESE popular tires with **Continental Demountable Rims** will be exhibited at both **New York Auto Shows**. **Every** car manufacturer in America recommends them as the **most** perfect and **economical** tire equipment when the carrying of **spare tires, already inflated**, is desired. **Cheerfully demonstrated** at all of our sales offices and orders filled three days from time wheels are delivered. We know you will want them on **your new car**, and to avoid delay **you must specify early**. Many present motorists are already "wise"—with them the fear of tire troubles is a thing of the past. Remember one investment only covers all expense—and any clincher tire and standard tube will fit. Our beautiful brochure "Continental Ready-Flated Tires" forwarded at your request.

Continental Caoutchouc Company

J. M. GILBERT, General Manager

Home Office: 1788-90 BROADWAY

NEW YORK CITY

BRANCHES:

Detroit, 226 Jefferson Avenue

San Francisco, 422-4 Van Ness Avenue

DISTRIBUTING AGENTS:

Albany, N. Y., Albany Hardware & Iron Co.
Boston, Mass., The Post & Lester Co., 821 Boylston St.
The Post & Lester Co., 288-90 Devonshire St.
The Post & Lester Co., 16 Park Square
Brooklyn, N. Y., Martin-Evans Co., 1186 Bedford Ave.
Buffalo, N. Y., Centaur Motor Co., 59 Franklin St.
Chicago, Ill., Excelsior Supply Co., 237 Randolph St.
Chicago, Ill., Western Continental Caoutchouc Co.,
1438 Michigan Ave.
Cincinnati, O., Cincinnati Auto Co., 908 Race St.
Cleveland, O., Chas. E. Miller, 1829 Euclid Ave.

Hartford, Conn., The Post & Lester Co., 175 Asylum St.
Huntington, L. I., Sammis & Downer Co.
Minneapolis, Minn., Plant Rubber Co., 322 First Ave., North
New Haven, Conn., The Post & Lester Co., 1085 Chapel St.
New Orleans, La., Revere Rubber Co., 700 Baronne St.
Philadelphia, Pa., Jas. L. Gibney & Bro., 211 North Broad St.
Springfield, Mass., The Post & Lester Co., 125 Bridge St.
St. Louis, Mo., Neustadt Automobile & Supply Co.,
3948 Olive St.
Toledo, O., Acme Rubber Co., 925 Jefferson Ave.

REPRESENTATIVES EVERYWHERE YOU MOTOR


Return this coupon and we will send beautiful booklet

Name.....

Street.....

City.....

State.....



It doesn't take the automobiling public long to learn which tires are giving the best service.

G & J TIRES

are made to give the automobile owner his full money's worth in service—and that they have made good is evidenced by their ever increasing demand. You will make no mistake in specifying them on your new cars.

Yes, we shall exhibit at both the New York Shows. If you will be there, call and see us; if not, write for a copy of our new catalogue.

G & J TIRE CO.
INDIANAPOLIS, IND.

Detroit, No. 256 Jefferson Ave.
Chicago, No. 1434 Michigan Ave.
New York, No. 10 W. Sixtieth St.
San Francisco, No. 414 Van Ness Ave.
Denver, No. 1541 Cleveland Place.
Buffalo, No. 912 Main St.
Philadelphia, No. 713 Broad St.
Los Angeles, No. 1010 S. Main St.
Minneapolis, No. 21 S. Second St.

Omaha, No. 1607 Harney St.
Atlanta, No. 35 N. Pryor St.
St. Louis, No. 415 N. Fourth St.
Boston, No. 110 Federal St.
Portland, No. 326 Burnside Ave.
Kansas City, No. 1607 Grand Ave.
Cleveland, No. 326 Frankfort Ave.
Pittsburg, Baum and Beatty Sts



What Good Tires Mean to You

Throughout the world Morgan & Wright tires are known as good tires—because they **are**.

To the motorist this statement of **demonstrated** quality means much, for—

It is a guarantee against wholly unnecessary repair bills—against **all** repair bills, in fact, except those necessitated by accident or natural wear;

It stands for **protection to the car**, which can be secured only by the use of tires that are built to withstand **emergency** tests as well as ordinary service;

It's an assurance that you will be spared the exasperating inconvenience which always attends breakdown of **any** kind—especially those against which you could be protected.

MORGAN & WRIGHT TIRES

have literally **won over** hundreds of motorists by reason of their protective quality—the quality that makes them absolutely safe under **any** condition.

Whether this protection is secured through the grade of materials used, or through our method of tire-building, or as a result of extremely rigid inspection which every tire undergoes before it is permitted to leave the factory, is comparatively unimportant to the user.

The vital consideration—and the only one that appeals to the experienced motorist—is this:

These tires actually stand up day in and day out under every condition of both load and road, as only tires can that are made as MORGAN & WRIGHT tires are.

And it is because users of these tires have repeatedly found this to be true, that we invite **all** motorists to give them an impartial comparative test.

There is no method of making friends equal to the method of **making good**.

MORGAN & WRIGHT, Detroit, Michigan

Branches, Agencies or Dealers everywhere.

Mr. Motorist:

You cannot afford to take the word of some other fellow in the important question of tires. The "show me" spirit of "the Man from Missouri" pervades the trade world of to-day. How many times have you heard and appreciated the truth of the old statement—"The Proof of the Pudding is in the Eating"?

AJAX TIRES

are the gratifying result of modern machinery combined with high-class materials and intelligent workmanship. A 5,000 mile written guarantee reflects the confidence of the Ajax-Grieb Rubber Company in their product. Write for a copy.

AJAX-GRIEB RUBBER CO.

General Offices: 1776 Broadway, N. Y. City

Factories: Trenton, N. J.

Branches:	
N. Y. City.....	N. E. Cor. 57th St. and Broadway
Boston.....	15 Park Square
Kansas City, Mo.....	1422 Grand Ave.
Denver, Colo.....	1529 Cleveland Place
Seattle.....	1102 Broadway
San Francisco.....	438 Market St.
Los Angeles.....	1038 So. Main St.
Philadelphia.....	316 N. Broad St.
Detroit.....	743 Woodward Ave.
Chicago.....	1418 Michigan Ave.

Milwaukee Agents: Goodyear Rubber Company

Exhibited at the Grand Central Palace and Madison Square Garden Shows



CELLULAR

SWINEHART TIRES

Are designed to meet every requirement
THOUSANDS IN SUCCESSFUL USE during the
past five years on every make of pleasure car.



TWIN TREAD

ELIMINATE YOUR TIRE TROUBLES

and expense by equipping with Swinehart Cushion Tires, easily applied to standard clincher or quick detachable rims with free hand applying tool.

OUTWEAR 3 TO 5 PNEUMATICS

EASY RIDING

NO

Punctures
Blow-outs
Inflating
Extra Tubes or Casings

Details in Catalog "C"

Swinehart Clincher Tire & Rubber Co.

AKRON, O.

CHICAGO:

1720 Michigan Avenue

NEW YORK:

875 Seventh Avenue



CONCAVE



SPARE TIRE

Call at our booth No. 137, Grand Central Palace, or booth 124, Madison Square Garden, New York Auto Shows

Republic Tires

THAT Staggard Tread →

is the only satisfactory answer to skidding problems. Other anti-skidding devices (chains, steel studs, etc.) are only for temporary use in wet weather. This tire is for continuous use and is especially valuable in cities where the sprinkling of the asphalt produces dangerous conditions even on fair days.

The Staggard Tread also means longer wear on account of the increased thickness. In fact, the tread is usually the last part of these tires to wear out, since these big studs do not tear off like the small protuberances of dotted treads.

Republic Rubber Co.
Youngstown, Ohio

New York City, 232 W. 58th St.	Seattle.....1419 Broadway.
Boston.....221 Pleasant St.	Denver.....1721 Stout St.
Philadelphia.....830 N. Broad St.	San Francisco.....166 First St.
Chicago.....116 Lake St.	Cincinnati...8th and Walnut Sts.
Detroit.....246 Jefferson Ave.	Toledo.....2815 Monroe St.
St. Louis.....3964 Olive St.	Indianapolis...208 S. Illinois St.
Pittsburg.....136 Sixth St.	Cleveland.....1120 Euclid Ave.
Los Angeles....1046 So. Main St.	Milwaukee....457 Milwaukee St.



Goodrich Tires

The Regular Equipment for 1909 on the

Pierce Arrow
Stoddard Dayton
Franklin
Auburn



Winton
Stanley
Rambler
Moline
Premier
Great Smith

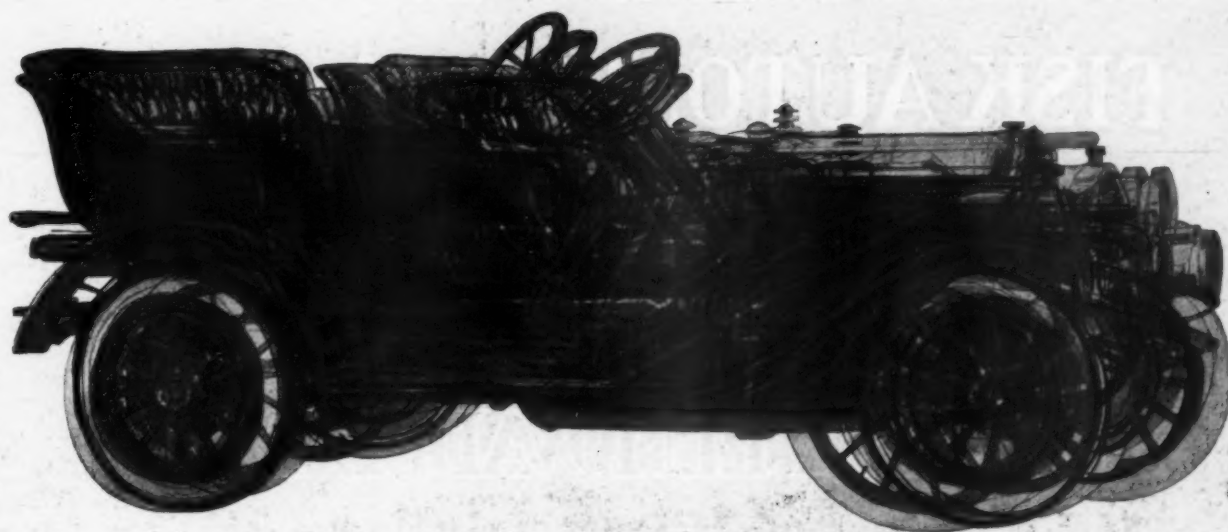
The selection of Goodrich Tires by such well-known manufacturers as The George N. Pierce Co., Winton Motor Carriage Co., Dayton Motor Car Co., Thos. B. Jeffery Mfg. Co., H. H. Franklin Mfg. Co., Premier Motor Mfg. Co., Auburn Automobile Co., Smith Motor Car Co., Stanley Motor Car Co., and Moline Automobile Company is significant not only to the patrons of those manufacturers but to all motordom.

It is a seal of approval from those best able to judge the relative merits of automobile tires—and those who want the best.

The B. F. GOODRICH COMPANY
Akron, Ohio

FACTORIES, AKRON, OHIO

Chicago, Philadelphia, Boston, Pittsburg, Detroit, Minneapolis, Cleveland, Kansas City, Atlanta, St. Louis, Denver, London, Paris. Our products are also handled in NEW YORK and BUFFALO by the B. F. GOODRICH COMPANY of New York, and in San Francisco, Los Angeles, Seattle.



The composite "shadowgraph" of these motor cars reveals the average tendency of leading American designers. A composite of all the Goodrich Road Records would reveal how largely Goodrich Tires have justified their selection in practically every endurance contest of importance in America—including the last four Glidden Tours—as well as in the hands of thousands of users.

In Every Sense of the Word—"The Tires with a Record."

THE B. F. GOODRICH COMPANY

Akron, Ohio

FACTORIES, AKRON, OHIO

Chicago, Philadelphia, Boston, Pittsburg, Detroit, Minneapolis, Cleveland, Kansas City, Atlanta, St. Louis, Denver, London, Paris. Our products are also handled in NEW YORK and BUFFALO by the B. F. GOODRICH COMPANY of New York, and in San Francisco, Los Angeles, Seattle.

FISK AUTOMOBILE TIRES

BOLTED-ON TYPE STANDARD CLINCHER TYPE
Q. D. CLINCHER TYPE INNER TUBES FOR ALL TYPES
FOR SALE BY ALL DEALERS FURNISHED BY THE MAJORITY OF MANUFACTURERS WHEN SPECIFIED

THE FISK REMOVABLE RIM

with BOLTED-ON TIRE is the
IDEAL TIRE EQUIPMENT

ABSOLUTELY SAFE

EASY TO HANDLE

Fisk Bolted-On Tires and Removable Rims will be furnished by any
of the following automobile manufacturers at the extra price of rims:]

3 1-2-inch and 4-inch - - - - \$60.00 per set including extra rim
4 1-2-inch—5-inch—6-inch sizes - - 75.00 per set including extra rim

The Acme Motor Car Co.
American Locomotive Co.
American Motor Car Co.
Atlas Motor Car Co.
Austin Automobile Co.
Auto Vehicle Co.
The Bartholomew Co.
Buckeye Mfg. Co.
Chalmers-Detroit Motor Co.
(On Model 40 only)
Corbin Motor Vehicle Corp.
Crawford Auto Co.
Dorris Motor Car Co.
Electric Vehicle Co.
Haynes Automobile Co.

Knox Automobile Co.
Locomobile Company of America.
Model Automobile Co.
Moon Motor Car Co.
Olds Motor Works.
Packard Motor Car Co.
Palmer & Singer Mfg. Co.
Peerless Motor Car Co.
Geo. N. Pierce Co.
Pope Mfg. Co.
Premier Motor Mfg. Co.
Royal Tourist Co.
The F. B. Stearns Co.
Stevens-Duryea Co.
E. R. Thomas Motor Co.

BOSTON—239 Columbus Avenue
SPRINGFIELD—135 Bridge Street
NEW YORK—1725 Broadway
PHILADELPHIA—1809 Race Street
ATLANTA—103 North Prior Street
BUFFALO—718 Main Street
CLEVELAND—1942 Euclid Avenue
DETROIT—262 Jefferson Avenue

SAN FRANCISCO—1036 Golden Gate Avenue

CHICAGO—1440 Michigan Avenue
ST. LOUIS—3907 Olive Street
MINNEAPOLIS—704 Hennepin Avenue
ST. PAUL—76 West Seventh Street
KANSAS CITY—1604 Grand Avenue
DENVER—1534 Glenarm Place
SEATTLE—910-12 East Pike Street
LOS ANGELES—722 South Olive Street

THE FISK RUBBER CO.

Chicopee Falls Mass.

SEAMILES'S

OUR GREAT SPECIALTY IS
THE MANUFACTURE OF

AUTOMOBILE RIMS

IN THE

**DETACHABLE, DEMOUNTABLE, REMOVABLE
and STANDARD CLINCHER TYPES**

ELECTRIC

We manufacture such Rims as the Goodyear, Goodrich, Firestone, Midgley, Fisk, Continental and others (all rims are inspected), which are made for the respective tire companies only.

WELDING

**WE DO MAKE AND SELL TO THE TRADE DIRECT
THE OLD RELIABLE STANDARD CLINCHER RIM**

OFFICIALLY INSPECTED AND STAMPED. SEND FOR CATALOGUE A

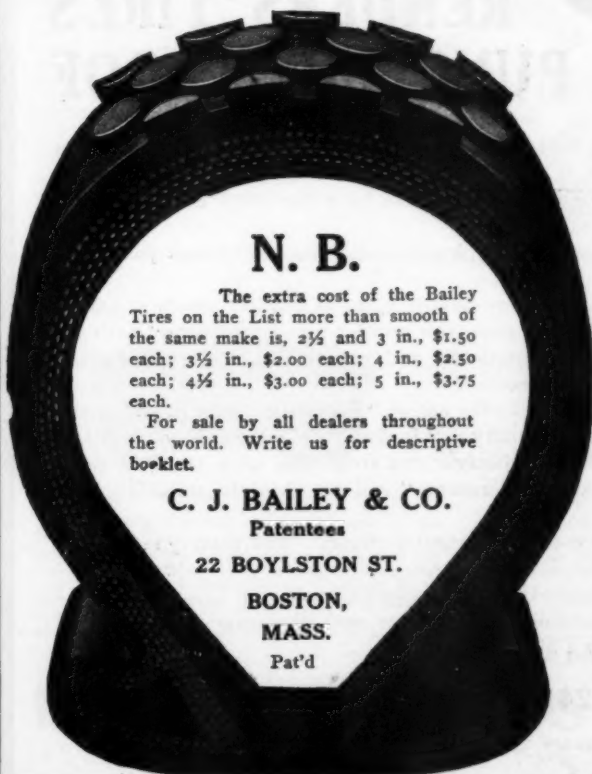
**THE STANDARD WELDING CO.
CLEVELAND**

We will exhibit at spaces
No. 124, Grand Central Palace
No. 163, Madison Square Garden
DON'T FAIL TO SEE US

STEEL RIMS

BAILEY'S WON'T-SLIP TREAD TIRES

NON-SKID ~ RUBBER TREAD



N. B.

The extra cost of the Bailey Tires on the List more than smooth of the same make is, 2½ and 3 in., \$1.50 each; 3½ in., \$2.00 each; 4 in., \$2.50 each; 4½ in., \$3.00 each; 5 in., \$3.75 each.

For sale by all dealers throughout the world. Write us for descriptive booklet.

C. J. BAILEY & CO.

Patentees

22 BOYLSTON ST.

**BOSTON,
MASS.**

Pat'd

The rubber studs forming the BAILEY "WON'T-SLIP" TREAD TIRES to prevent **skidding** and give perfect **traction** were the **correct principle** to start with.

After being in general use for over eight years on Automobiles, Motor Cycles and Bicycles in the United States and Europe, the principle of the BAILEY TREAD has proved to be **absolutely correct**.

Twelve of the largest **tire** manufacturers in the world (nine in the United States and three in Europe) endorse this as licensees under the patents to make and sell the BAILEY TREAD.

In fact, the principle is so **perfect** that it is **impossible** to produce a substitute.

**Licensed Manufacturers in the
United States**

The B. F. Goodrich Co.,
Akron, Ohio.
The Diamond Rubber Co.,
Akron, Ohio.
The Fisk Rubber Co.,
Chicopee Falls, Mass.
Hartford Rubber Works Co.,
Hartford, Conn.
G. & J. Tire Co.,
Indianapolis, Ind.
Goodyear Tire & Rubber Co.,
Akron, Ohio.

Morgan & Wright,
Detroit, Mich.
Empire Automobile Tire Co.,
Trenton, N. J.
Consolidated Rubber Tire Co.,
New York City.
The B. F. Goodrich Co.,

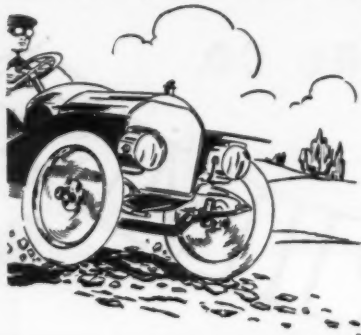
Licensed Manufacturers in Europe

7 Snow Hill, London, E. C., Eng.
The North British Rubber Co.,
Edinburgh, Scotland.
Hanover Rubber Co.,
Hanover, Germany.

40 per cent. Less Tire Expense

We have some interesting service facts and figures bearing on the economy of driving Pennsylvania Steel Studded Non-Skids, compared with the expense of driving plain tires equipped with non-skid devices. The figures have been carefully proven in practice and indicate a difference in expense of more than 40 per cent. in favor of the Steel Studded Non-Skid type of

PENNSYLVANIA CLINCHER TIRES



Write for our new booklet, "Economical Winter Tire Service," in which these figures are tabulated. Of valuable interest to every motorist.

PENNSYLVANIA RUBBER CO.
Jeannette, Pa.

San Francisco: 512 Mission St.
New York: 1741 Broadway.

Chicago: 1241 Michigan Ave.
Boston: 167 Oliver St.
Cleveland: 21434-6 East Ninth St.



"PERMANIT"

RENDERS TIRES PUNCTURE PROOF



It is comforting and affords a whole lot of satisfaction to know that if a puncture comes to your tire, it will be automatically stopped and that you won't have to wait and make tire changes or lay by a few hours until some one comes to your relief.

"Permanit" affords all of these pleasing conditions and keeps your tires perfect all the time.

"Permanit" is not a tire filler—simply 8 ozs. of powder which is placed in the inner tube. If a puncture comes, this powder coming in contact with the air forms an immediate seal automatically and without attention, except perhaps a stop of half a minute or less.

It may pass in your mind that the use of "Permanit" may in some way damage your tire or abate its elasticity. If it does, we'll furnish you with a new tire at our expense. F.O.B. wherever you are. The only possible thing you can expect from the use of "Permanit" will be absolute reliability, efficiency and satisfaction.

So there you stand. Here is a solution of your tire troubles, right at hand. The least you can do is to ask for proofs and details and the sooner, the better, for you.

"Permanit" is the quickest seller a dealer can have—the profit is worth while.

In your own interest, write to-day and get full particulars and prices and discounts to dealers, or send 53c. for sample carton, 2 ozs. which is sufficient for a bicycle tire.

The ADOLF KARL COMPANY, 241 Washington St., Newark, N. J.

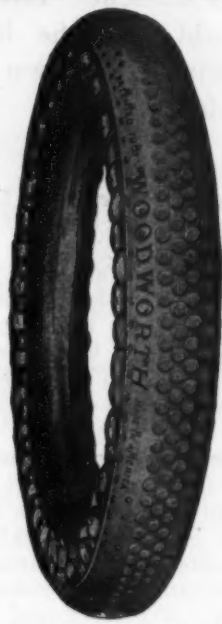
See our exhibit at the Madison Square Garden Show.

WOODWORTH TREADS—1909



SELF-ADJUSTING TREAD.

The newest and neatest. Easily attached to the tire and *adjusts itself* quickly without straps or buckles, and *stays adjusted*. The Woodworth *Self-Adjusting Tread* gives the tire absolute protection. It is puncture-proof and prevents skidding. Presents an armored surface to the road and shields the tire perfectly. Is quite invisible when the wheel is in motion.



ADJUSTABLE TREAD.

This popular device will be continued as hitherto. This means that we shall make both the new Woodworth *Self-Adjusting Tread* and the popular Woodworth *Adjustable Tread*. In ordering be sure to designate the one you want. If you simply order Woodworth Tread, the *Adjustable Tread* will be sent. If you want the *Self-Adjusting Tread*, ask for it.



SELF-ADJUSTING RUBBER TREAD.

In construction this is the same as the regular *Self-Adjusting Tread*, but with the difference that the outer tread is a heavy band of rubber secured to the body of the tread proper with strong steel rivets having heavy heads and which project sufficiently to practically prevent skidding and yet allow the rubber to come in full contact with the road.

The Woodworth *Special Tread* is almost indispensable where roads are cut with ruts or unusually rocky or full of deep, frozen and rough depressions. The sides of the tread are closely studded with round-headed steel rivets, which protect the leather from scouring or grinding against the sides of the ruts and the wear and tear mentioned. They have been in great demand in various parts of the country and have given absolute satisfaction everywhere.



WOODWORTH KANT-SKID protects the tire instead of injuring it. Takes firm hold on the road and makes skidding practically impossible. New sections can be put in when necessary without tools. Does not injure the road or the tire. Cheaper and better than any all-metal device.



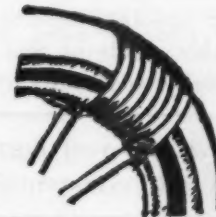
REPAIR BOOT.

Of the same material and construction as the Woodworth Tread. Held on the tire by a heavy strap laced through four rings and adjusted by a buckle. Very strong, durable and easy to adjust. Prices: 2½ or 3 inches, \$1.25 each; 3½ or 4 inches, \$1.50; 4½ or 5 inches, \$1.75.



INSIDE SHOE PATCHES.

Woodworth Patches are designed for patching the inside of the tire shoe. They are made of chrome leather, are tough and very strong and are easily secured with rubber cement. The Patches are oval in shape, are in three sizes and at following prices: 4x6 inches, 15 cents; 5x8 inches, 20 cents; 6x10 inches, 25 cents.



EMERGENCY STRAP.

A chrome leather strap for binding up a weak or burst tire shoe. There is a strap and buckle on each end for attaching to the spokes. Very convenient to carry. One size fits all tires. Price, \$1.00 each.

New catalogue and price list ready to send out. Write for them.

LEATHER TIRE GOODS CO., Newton Upper Falls, Mass.

New York Store, 1662 Broadway

GENESEE MECHANICAL CLINCHER AUTOMOBILE TIRE



Tire with Highest Quality

To say nothing of the maker's responsibility, so good a principle embodied in it demanded that the Genesee Tire be as near perfection, in quality of material and workmanship, as human effort could make it.

The very best grade of Old Fine Para Rubber, specially selected; and best obtainable grade of Sea Island Cotton, specially woven to our order;

The Genesee Tire is the **Only Clincher Tire in the World with the improvements here shown and described.**

Speaking broadly, all tires **except the Genesee Tire** are of a like construction, differing only as to **quality.**

Look at this sectional of a Genesee Tire—note the exclusive and **natural** wedge lock—and **mechanical** lock formed by valve. Not a lug needed—not a bolt needed to secure tire to rim.

Genesee Tires cannot creep. The full, firm foundation is locked to rim by means of valve. The improved formation of it provides ample foundation for itself, and for the inner tube to rest upon. A perfect and complete **support** for tire and for inner tube. **No other make can have this.**

This Genesee construction absolutely prevents water, dirt or other foreign substance from entering the tire. There is no possible space for it.

The inner tube cannot be pinched or chafed, because the inner edge of

tire in this construction, as you notice, is **flush** with the entire inside surface, thus forming a continuous, naturally round tube. No chance for inner tube to get caught between lugs—there are no lugs.

The entire volume of inner tube is always **above the rim**, thus securing the benefit of **all the air space**, which means the maximum of resiliency and speed.

The inner tube is supported equally on all sides, which divides the strain evenly on every bit of its area, adding durability and greatest possible mileage.

The Genesee is the only perfectly balanced clincher tire. That is, the weight of the outer edge or circumference exactly equals the weight of its inner edge—the part next the rim. All tire experts have known the good of this principle of weight distribution, but none others have succeeded in carrying it out practically. This feature makes for the maximum of mileage.

This equal division of weight also places all side strains on that part of tire best able to resist unusual strains, and at the same time renders the Genesee Tire absolutely safe against accidentally being stripped from rim.

these are the only materials used.

To make good, reliable tires demands a high type of sober, skilled and **loyal** men. Our factory located in the heart of the tire-making industry, we know the best men in the business. They are in our employ.

Nothing but the high-grade Genesee Tire is made in this factory. The best thought and undivided energy is being devoted exclusively to the manufacture of this Tire alone.



To the dealer—you can make no mistake in pushing this tire with your trade this season. The quality and construction is first-class in every respect—write for prices.



Flint, Mich.



How To Bring Up A Tire On A Bottle In Thirty Seconds



Goodyear Air Bottle Means No More Tire Pumping

NEVER hear of bringing up a tire on the Goodyear Bottle? Sure! It beats the old-fashioned way of bringing the tire up by hand "all hollow." Not one-tenth the trouble.

And tires brought up on the Goodyear Bottle are well brought up too,—better behaved—more healthy—live longer—do a good deal more work—save you a lot of money.

It's such a big success that we are going to give every motorist in the world a chance to try it free for two years—charging only the nominal cost of the first bottle.

The Goodyear Air Bottle is a small steel bottle charged with pure air (not gas). It is usually carried under the seat or on the running-board of an automobile.

When you want to inflate a tire, you simply attach the rubber tube from the Air Bottle to the tire—open the valve and let 'er fill.

While you stand by and comfortably watch the performance until time to shut 'er off.

Doesn't look much like your old familiar job of giving an imitation of your wash lady in the midst of her Monday morning exercise, does it? Doesn't feel like it, either.

No more back-breaking, hand-blistering tire pumping! That grim task which robbed motor- ing of its pleasure can be crossed off your list of troubles.

Any woman or child can inflate a tire with the Goodyear Air Bottle—it's so simple.

And the beauty of it is that the tire can be brought up to just the right pressure.

This is important. It makes tires last 50 per cent longer. Under-inflated tires give out quickly.

By inflating to *exactly* the right pressure with the Goodyear Air Bottle, rim-cuts and other tire troubles are avoided. Ninety per cent of tire troubles come from under-inflation.

If you have Goodyear Detachable Auto Tires on Goodyear Uni- versal Rims, the Goodyear Air Bottle will enable you to be on your way a few minutes after the puncture occurs.

And with *any* tire, it cuts out half the work and drudgery.

Any motorist in the last Glidden Tour can tell you what a blessing the Goodyear Air Bottle is. A big truck loaded with Goodyear Air Bottles met the tourists from day to day at the various points of the tour.

All contestants who desired the Free Goodyear Air Bottle service were supplied, regardless of the kind of tires they rode.

Every day the empty bottles were taken back and replaced with fully charged ones.

Thus, the Glidden Tourists always had a fresh filling for a de- flated tire right at hand—no delay—no labor.

Altogether the Goodyear Air Bottle was voted the best thing that had happened since the Glidden Tour began.



Our Offer to all Motorists— Free Air for Two Years

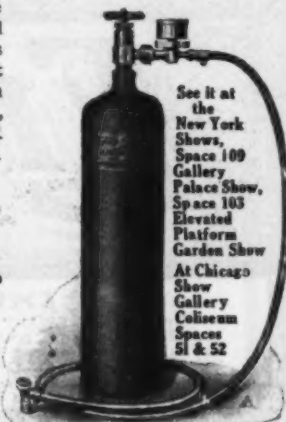
The Goodyear Air Bottle costs only \$15 for the small bottle designed to carry under the seat, or \$20 for the larger bottle, which is de- signed for carrying on the running board, filled with compressed air—no gas to ruin the tires, corrode the valves, or condense within a few hours, leaving the tires soft, thus making it necessary to constantly repeat the operation to maintain the desired pressure.

The first cost is the only cost for two years, thereafter we may make a nominal charge for refilling. But for two full years, when the bottle is empty you simply turn it in at any Goodyear Branch or listed agency and receive a new bottle, ready charged.

You do not have to wait. You exchange the empty bottle for a new charged one instantly. Each small bottle will fully inflate four to eighteen clincher tires—according to their size— and each large

bottle from six to thirty-five. They will partially inflate many more. The bottles will inflate approximately 15 per cent fewer Goodyear Detachable Tires than Clincher Tires of corresponding size, the reason being that the GOODYEAR DETACHABLE TIRE IS 15 PER CENT OVER SIZE.

Write us for our "The Care of an Auto Tire," which gives valuable information about the care of tires and the exact pressure to which each size of tire should be inflated to give the longest service.



See it at
the
New York
Shows,
Space 109
Gallery
Palace Show,
Space 103
Elevated
Platform
Garden Show
At Chicago
Show
Gallery
Coliseum
Spaces
51 & 52

The Goodyear Tire & Rubber Co., Argo St., Akron, O.

Branches and Agencies:

Boston, 261 Dartmouth Street
Cincinnati, 317 East Fifth Street
Los Angeles, 932 South Main Street
Philadelphia, 1402 Ridge Avenue
New York, 64th St. and Broadway
San Francisco, 506 Golden Gate Ave.

Chicago, 80-82 Michigan Avenue
Cleveland, 2005 Euclid Avenue
Milwaukee, 188-192 Eighth Street
St. Louis, 3935-3937 Olive Street
Buffalo, 719 Main Street
Detroit, 251 Jefferson Avenue

Pittsburg, 598S Centre Avenue
Omaha, 2010 Farnam Street
Washington, 1026 Connecticut Ave.
Atlanta, 90 North Pryor Street
Louisville, 1043-1051 Third Street
New Orleans, 706-716 Barrone St.

Memphis, 181-185 Madison Street
Dallas, 111 North Akard Street
Denver, 28 West Colfax Avenue
Baltimore, 991 Park Avenue
Kansas City, 16th and McGee Streets

DAYTON AIRLESS TIRE "Makes Good"



No Pumping; No Puncturing; No Blowouts; No Delays. So calculated and constructed mechanically that it is equally as resilient as a pneumatic tire.

The season of 1908 not only a success but a triumph! During the season of 1908 we made thousands of tires and sold them in nearly every state in the Union and several foreign countries, for all weights of cars from 900 pounds to 4,500 pounds unloaded, driven by all kinds of drivers on all sorts of roads. Many of them have already run from 3,000 to 5,000 miles and are still in good condition, and appear to be good for two or three times as many more miles.

There is nothing new mechanically, nor "freakish" about a **DAYTON AIRLESS TIRE**. It is built exactly as an engineer would construct a bridge. The rubber columns in the tire correspond with the columns of a bridge, while the tread surface of the tire corresponds with the road surface of the bridge; and the heavy annular rib or extra fabric in the tire, forming the very thick tread, corresponds with the heavy beams connecting the bridge columns. This heavy annular rib of fabric in the tire strengthens between columns, so that there will be no more depression between the columns than right over the columns, hence the tire wears uniformly all around the tread. The columns vary in thickness and strength corresponding with the different weights of cars.

The difference between a **DAYTON AIRLESS TIRE** and a solid tire is the difference between a properly constructed bridge and a dam.

There is no sponge rubber nor metal of any kind in the construction of a **DAYTON AIRLESS TIRE**, but only the highest grade of Up-River Para Fine Rubber, and the best Sea Island Fabric, together with the necessary ingredients to give strength to the rubber and cause it to cure or vulcanize properly.

The tire is moulded or "cured" over a metal form in one operation, hence the columns are a part of the tire and will not separate therefrom nor crush down.

We will guarantee:— **FIRST:** That the tire rides as easily as a properly inflated pneumatic tire.

SECOND: That it will sustain its rated carrying capacity stamped thereon, and retain its resiliency, and the columns will not crush down.

THIRD: That a car equipped with our tire will not consume any more gasoline and will run as fast as if equipped with pneumatics.

FOURTH: That it will outlast several average pneumatics.

FIFTH: That it will fit standard Clincher rims; can be applied easily and cannot come off in use.

Write to-day for illustrated catalogue containing full particulars of tire, guarantee and testimonials, even though you are not in immediate need of new tires. It will pay you to know the "last word" on tires—The 1909 **DAYTON AIRLESS**.

THE DAYTON RUBBER MFG. CO.

1204 Kiser Street, DAYTON, OHIO, U. S. A.

New York Salesroom, 1966 Broadway.

See us at space 316, 3rd floor, Grand Central Palace Show, Dec. 31 to Jan. 7th. Also space 445 3rd tier Boxes, Madison Square Garden Show, Jan. 16th to 23rd.

DOW TUBES

DO THE TRICK—HOLD AIR AFTER PUNCTURE—TRY THEM YOURSELF.

2000 Broadway
NEW YORK

DOW TIRE COMPANY

389 Boylston St.
BOSTON, MASS.

Empire Tires

WEAR LONGEST

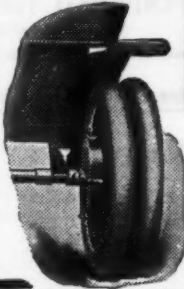
EMPIRE AUTOMOBILE TIRE COMPANY, Trenton, N. J.

Branches—NEWARK—264 Halsey St. DETROIT—842 Woodward Ave. BOSTON—202 Devonshire St. CHICAGO—20 La Salle St.
1301 Michigan Ave. NEW YORK—73d St. and Broadway, 148 Chambers St. Agents—PITTSBURG—Consumers' Auto Supply Co. KANSAS
CITY, MO.—Empire Tire & Rubber Co. ATLANTA, GA.—Dunham Rubber Co. CLEVELAND, O.—Motor Supply Agency Co. NORFOLK, VA.—Wm.
H. Grover. DENVER, CO.—Denver Auto Goods Co. JACKSONVILLE, FLA.—Savell Rubber Co. PHILADELPHIA, PA.—Penn Auto Supply Co.
LOS ANGELES, CAL.—Pacific Electrical Works. BUFFALO, N. Y.—Empire Sales Co. MINNEAPOLIS, MINN.—Empire Tire & Rubber Co.
SAVANNAH, GA.—Harris Tire Co. NEW ORLEANS, LA.—H. A. Testard.

BURROWES SPARE WHEEL

Best emergency wheel made. Carried equipped with inflated tire on step or back of car, ready for instant use. Applied without removing deflated tire. Clamps securely to rim of auto wheel. Creeping impossible. Makes no difference in running or steering of cars. All standard sizes for clincher or quick detachable tires.

**E. T. BURROWES
& CO.**
PORTLAND, MAINE



SAMSON TYPE COURSE RUBBER TUBES

MADE IN FRANCE

KING OF TIRES TIRE OF KINGS

SAMSON LEATHER TIRE CO.,

1634 to 1642 BROADWAY
G. de PONTAC Gen. Mgr. NEW YORK CITY

TWENTIETH CENTURY TIRE PROTECTOR

Absolute Tire Protection

No possibility of Punctures, Blowouts or Skidding, as the "20th Century" Protector not only covers the tread but the ENTIRE TIRE. Automobilists—You need this. It will save Money, Time and Trouble. Let us explain full details of its many advantages over all others. Write for full particulars to-day.

THE PERKINS-CAMPBELL CO.,
Licensed Mfrs., 622 Bway, Cincinnati, O.

STEEL TIRES

Full of Air.
Can't Puncture.
Steel link bands
hook to rim.
A few sections
will hold any
old blowout.
The only pro-
tector that
will hold rim
cut.

Cover tires with this
armor and they
will last forever;
how can they get
away if encircled
by steel?

As flexible as
rubber.
Anti-Skid.
Thousands in
use.
Tire bills cut in
two.

**KIMBALL TIRE
CASE CO.,**

171 Broadway,
Council Bluffs,
Iowa



The New Motz Non-Skid Cushion Tire

Fits Universal and
Standard Clincher
rims. We furnish
a tool for applying.
Send for circular J.

The Motz Clincher
Tire & Rubber Co.
Akron Ohio



P S & CO.
RED INNER TUBES
GUARANTEED
PURE PARA RUBBER
PARKER, STEARNS & CO., NEW YORK

Construction of a Gasoline Motor Vehicle

By C. C. BRAMWELL. Contains
150 pages, 6 x 9; one hundred illus-
trations and diagrams. Publisher's
price, \$2.00; our price, 50 cents.
Address The Automobile, 231-241
West 39th St., New York.



THE EMERGENCY WHEEL

NOTICE!

Big Reduction in Prices
Write for revised price list

Black Mfg. Co., Ft. Wayne, Ind.

A complete tire change can be made in 3 minutes
by unskilled operators with the

Healy RAPID REMOVABLE Rim

Fitted to old or new wheels in 24 hours. Guar-
anteed to stand hardest wear. Price \$60, with extra
rim and wrench. Write for catalogue.

**Healy Leather Tire Co., 88-90 Gold St.,
NEW YORK**

100 Manufacturers Using and Testing INDESTRUCTIBLE STEEL WHEELS

O.K. them in every way. Write us for information
INDESTRUCTIBLE STEEL WHEEL CO.

1224 Michigan Ave. CHICAGO

The Practical Gas Engineer

WHAT TO DO AND HOW TO DO
IT. A book of 150 pages, neatly
bound in cloth. Sent postpaid for
\$1.00. Address The Automobile,
231-241 West 39th St., New York.



The Stepney Spare Motor Wheel
is a device the adoption of which
will serve to obviate the
tire troubles experienced in
motoring.

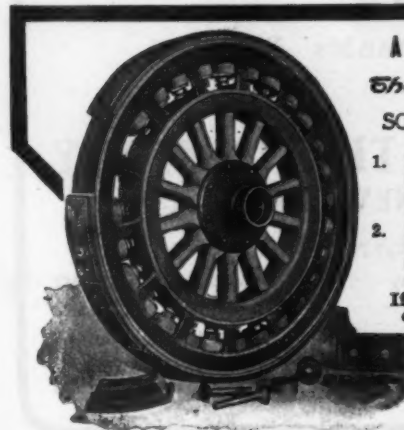
It is simply a stan-
dard clincher steel rim,
without hub or spokes,
having four clamps
(two stationary and
two adjustable) for
securing it to the rim
of the injured wheel.

The Stepney is in-
tended for your Spare
Tire to be carried upon
it fully inflated and
ready for use. Any
standard clincher tire
can be used.

Write to-day for cata-
log B.

**The SPARE MOTOR WHEEL
CO. of America (Ltd.)**

236 Michigan Avenue, Chicago



A Commercial Proposition The LEA WHEEL SOLVES THE PROBLEM

1. It has the resiliency of a solid rubber WITHOUT its faults; no tearing off or crawling.
2. Has the stability of steel tread and can be replaced at a fraction of the cost of solid tires.

If you are up against the
commercial proposition
WRITE TO-DAY.

E. S. LEA
Lamberton & Lahr Bldg
TRENTON, N.J.

MICHELINS

Until you use a
Michelin Tire
properly inflated you do
not know what
a good tire is.

Michelin superiority is particularly shown in
Michelin Anti-Skids.

EXHIBITING AT

New York, Grand Central Palace
New York, Madison Square Garden
Chicago, Coliseum
Boston, Mechanics' Building

MICHELIN TIRE COMPANY
MILLTOWN, NEW JERSEY, U.S.A.

BRANCHES

NEW YORK, 1763 Broadway	247 Jefferson Ave., DETROIT
CHICAGO, 1344 Michigan Ave.	2001 Euclid Ave., CLEVELAND
BOSTON, 895 Boylston St.	15 E. Colfax Ave., DENVER
BUFFALO, 908 Main St.	1200 So. Main St., LOS ANGELES
PHILA., 320 N. Broad St.	308-314 Van Ness Ave., SAN FRANCISCO



"UNIVERSAL" DETACHABLE FULL TREAD

YOU NEED IT! HERE IT IS!
The only tread on the market having
an ADJUSTABLE TENSION ANCHORAGE.

Unlimited TENSION. Always Adjustable. Our Positive ANCHORAGE ELIMINATES TIRE INJURY. A Real PROTECTOR; ABSOLUTELY NON-SKID AND PUNCTURE PROOF. The SAFE AND SANE PROTECTOR for all road conditions.

Write to-day for Descriptive Circular and prices.
UNIVERSAL TIRE PROTECTOR CO.
ANGOLA, IND.

The Complete Motorist

¶ No theory, but all about an automobile—its history; its mechanism and how to select and run it. By A. B. FILSON YOUNG. 328 pages, profusely illustrated. Bound in cloth. Price, \$3.50. Address, The Automobile, 231-241 West 39th Street, New York.



TIRE-INSURANCE

Make One Set of Pneumatic Tires Practically Last You Forever

A Protector that protects. Fits any pneumatic tire made. Easily attached. Is not fastened to tire, wheel or rim, so cannot injure tire. Wagon ruts, glass, stones or rough roads do not wear tires with this protector on them. Made of cross-shaped steel links, case-hardened. Write today for booklet and price-list, and stop all further tire trouble.

SLAMA TIRE PROTECTOR CO., 612 East 15th Street, Kansas City, Mo.

The Automobile Trade Directory

is constantly referred to by Managers, Mechanical Engineers, Superintendents, Purchasing Agents, the men who *specify* and *buy* parts and materials for the construction of cars, and by Dealers, Garages, Supply Jobbers and the entire trade. Its sole purpose is to tell the buyer *who makes* the thing he wants, and the arrangement of our classified list presents the advertiser's name and announcement to the purchaser just when the latter wants the identical thing advertised.

SPECIAL SERVICE

Advertisers are loaned our complete Mailing List, comprising every Garage, Electric Charging Station, Salesroom, Repair Shop, Supply House and the purchasing agents, mechanical engineers, etc., of automobile manufacturing concerns in the United States and Canada.

This list is absolutely necessary to complete your follow-up system

¶ If your advertisement is not appearing in its columns it will pay you to investigate our proposition.


Write us for particulars

THE AUTOMOBILE TRADE DIRECTORY
231-241 West 39th Street, New York.

"Firestone"

NON-SKID TIRE

The tread is composed entirely of rubber; it is formed by the raised oblique lettering, "FIRESTONE NON-SKID." Presents a greater variety and number of angles and edges and points of road contact to prevent slipping than any other Non-Skid in existence.



The wear-resisting quality of this Tread is a revelation to motorists accustomed to the extravagant expense and short-lived efficiency of ordinary non-slip devices.

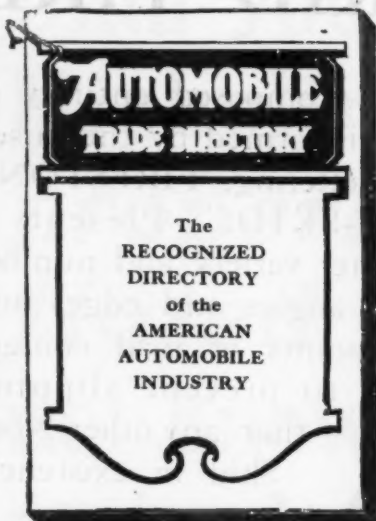
ASK TO SEE IT

Firestone Tire & Rubber Co.
Akron, Ohio

Branches and Agencies Almost Everywhere



WHERE TO BUY



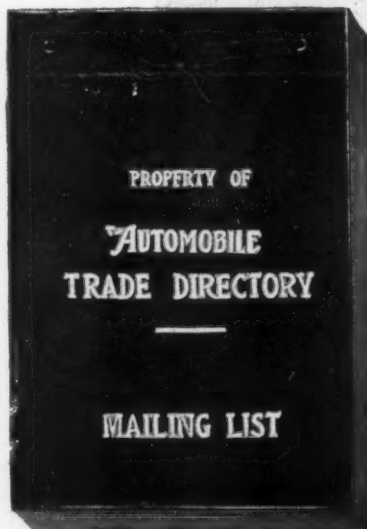
An invaluable publication for those interested in the automobile and allied trades, revised and published quarterly—January, April, July, October. It is the one and only recognized Directory of the American automobile industry. From 1903, when it entered the field as a 32-page pamphlet, up to the issue of October, 1908, containing 466 pages, this publication has kept abreast of the rapidly growing industry it represents, and to-day has the largest advertising patronage of any publication in its field.

Copied in one instance, imitated in a weak, desultory fashion in several others, but standing always alone in its strength, The Automobile Trade Directory is now starting on its seventh year of supremacy and is to-day the only reference book of the Trade that completely covers the field.

Its advertising pages offer exceptional opportunity to the manufacturers of parts and appliances who want to keep in touch with the vast field covered by this publication—made up of those who recommend, specify and buy.



WHERE TO SELL



Loaned to Directory advertisers. Comprises every Garage, Electric Charging Station, Salesroom, Repair Shop, and the Purchasing Agents, Mechanical Engineers, etc., of Automobile manufacturing concerns in the United States, Canada and Mexico. For the benefit of our advertisers, no expense or trouble is spared in the compilation of this remarkably comprehensive list. Every known source of information is constantly being followed up in order to keep the list fresh and accurate. To you, as an advertiser, it will be invaluable as a method of following up your advertising in your own way. Through its agency you can keep in accurate touch with all new enterprises and eliminate waste, energy and expense in the matter of following up concerns who are out of business.

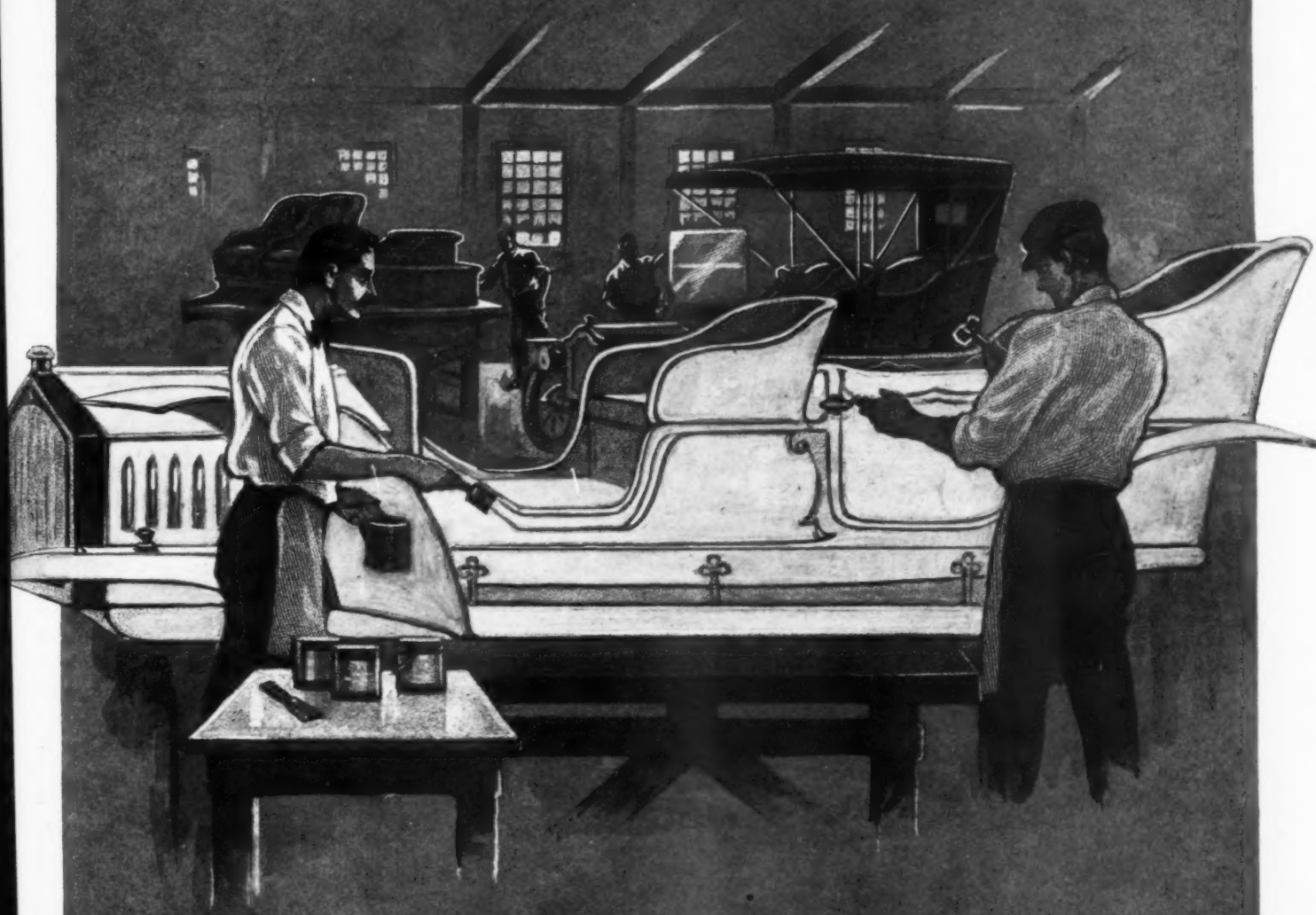
This List alone is valuable to you in many ways—in conjunction with your advertising in The Automobile Trade Directory it is invaluable.

Advertising rates, sample sheets of Mailing List and detailed information sent on request

THE AUTOMOBILE TRADE DIRECTORY
231-241 West 39th St., New York



Body Section



INCLUDING

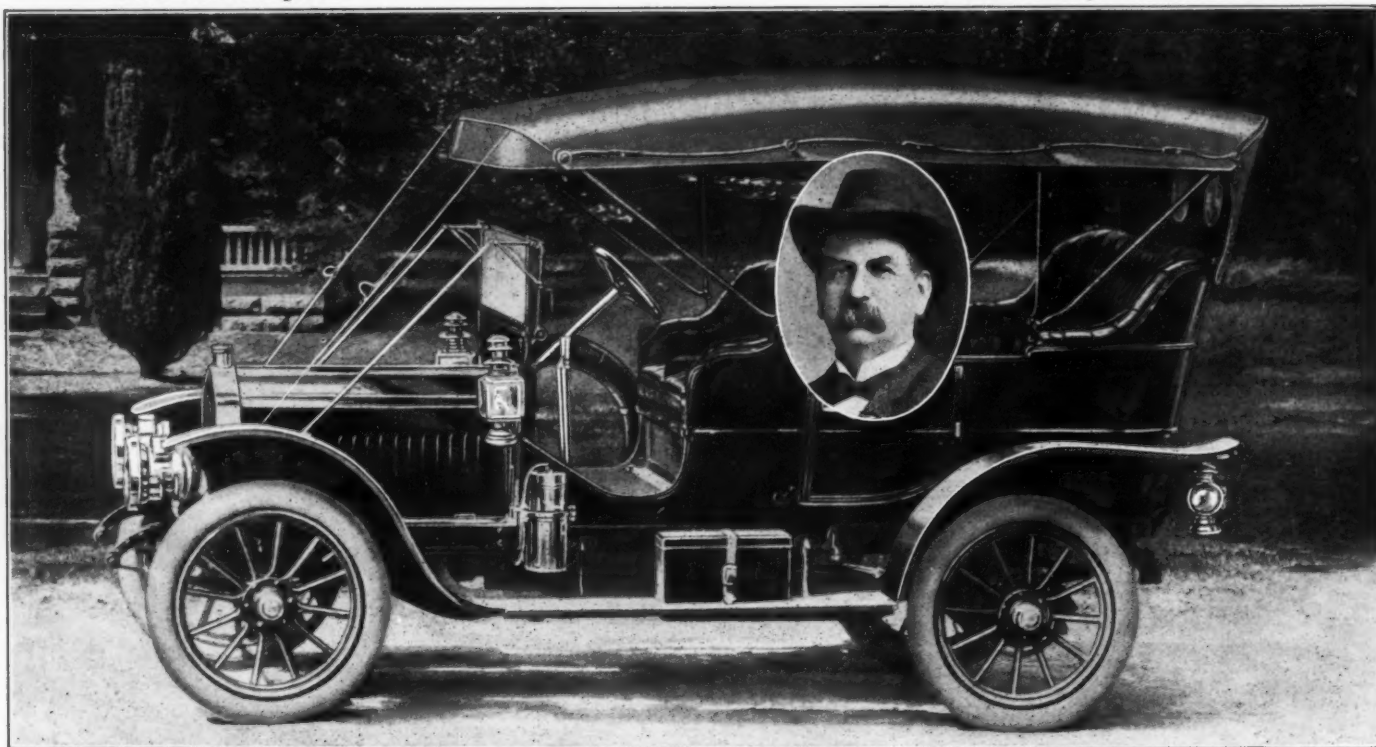
Tops, Mud Guards, Upholstery, Paints, Varnishes, and
Other Finishing Materials, etc.

THE MAN BEHIND THE SPRAGUE TOPS AND FRONTS

COL. JAMES H. SPRAGUE

"THE SPRAGUE IDEA"

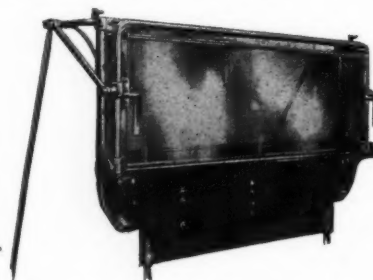
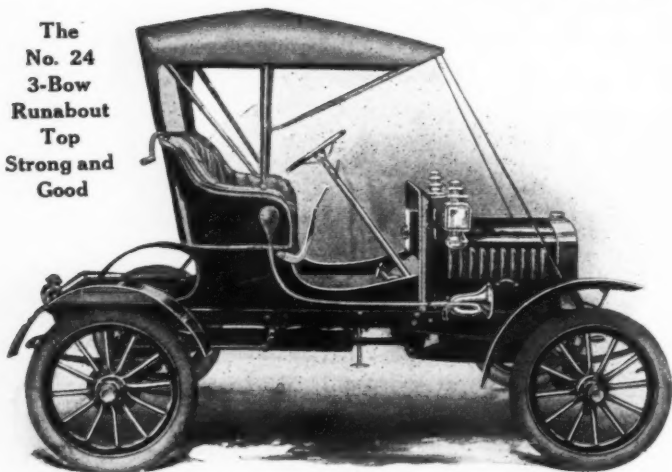
"MADE THE SPRAGUE WAY"



o. 120

Elegant in detail. Superb in finish. Made as a fitting accessory to the best cars.
If you want the BEST, you can get them nowhere else.

The
No. 24
3-Bow
Runabout
Top
Strong and
Good



Our No. 70 Solid Brass Front.
Perfection, Common Sense.

When you buy a wind shield you should buy the best, therefore you should buy a Sprague. You can see our fronts at the shows on the Elmore, the Pope-Toledo, the Apperson, the National, the York, Pullman and other good cars.

WE WILL ALSO HAVE A FINE EXHIBIT
IN ALL THE SHOWS

COL. SPRAGUE WANTS TO SEE YOU

ASK FOR OUR NICE PRICE LIST AND ELEGANT CATALOGUE

Regardless of what others may claim we still have over five acres of floor space in our factory.

THE SPRAGUE UMBRELLA CO., Norwalk, Ohio, U. S. A.

nd
uy
ou
ue.
nts
he
le-
he
ill-
rs.

I

T
cl
w
it
de
cu
ti
an
po
au
th

ion
of
ha
dis
th
wo
wh
the
ne
bil
tha
the
ou
in
Th

ste
bro
and
Fr
siv
me
kne
ove
ing
a s
ide
the
ple
par
cou
men
pro
wor

V
of
rum
back
they

O
type
top
littl



FROM the rear entrance tonneau to the elaborate creations of two or three years ago were as echoes from abroad. The makers of bodies in America ultimately reached the conclusion that utility and stability ought to have something to do with the project. The side entrance is an American idea, but it did not reach the point of its full significance until American designers interjected a little common sense. The swanlike curves and fantastic configuration so dominant in the late creations have given way to straight line work, comfortable seats, and the requisite amount of foot room. It is no longer possible to induce an autoist, or, for that matter, a builder of automobiles, to consider any scheme of design that savors of the proverbial sardine box.

In bodies of the past the distance from the top of the cushions to the deck ranged from 16 to 18 inches, while in bodies of the present time the average distance is scarcely more than half of the value above given. In the earlier types of bodies the distance from the seat panel to the dash, or between seats, as the case might be, ranged around 20 inches, while in modern work the minimum distance is about 25 inches. In the old days, when designers wanted to know how high to make the seats, they measured the height of a chair from the floor, while in the new bodies they took into account their experience in automobiles. In the course of time it dawned on designers of bodies that racing drivers insisted upon seats very close to the deck, and they seemed to be able to maintain their positions under strenuous conditions for hours at a time, whereas autoists perched high in the seat were much fatigued in a hundred miles of travel. The influence of racing is to be seen in bodies at every hand.

The Several Types of Bodies Extant.—Runabouts, roadsters, five-passenger touring, seven-passenger touring, limousine, brougham, victoria, landaulet, cabriolet, surrey, taxicab, and the types of commercial bodies, as delivery and truck. From the runabout to the seven-passenger touring car, inclusive, the bodies are practically all straight-line effect, and special mention should be made of a comparatively new type of body known as the "close-couple," in which a rumble seat is placed over the rear axle and behind the rear seat proper, thus affording seating capacity for six in cars of a wheelbase length to take a seven-passenger touring body. In the close-couple design the idea is to afford a place for the chauffeur during the time when the owner holds the wheel, and thus the owner is allowed the pleasure of driving the car and greater privacy is offered the party by seating the chauffeur in the rumble seat. This close-couple body has other advantages, among which it might be mentioned that the occupants of the rear seat within the body proper will not be jolted to anything like the same extent as they would be were the rear seat located over the rear axle.

With a view to the greatest possible convenience, numerous of the runabout types of bodies are provided with a folding or rumble seat on top of the tool box in the space available at the back. The little cars are, therefore, more commodious, and they certainly present a better appearance.

Offerings in Runabout Types.—Numerous of the runabout types of bodies are provided with a folding or rumble seat on top of the tool box in the space available at the back. The little cars are, therefore, more commodious, and they certainly

present a better appearance, eliminating the "dinky" effects so abhorrent to owners of small cars. These bodies are, of course, prototypes to a smaller scale of the roadster type of bodies to be seen at every hand.

The builders of cars now consider the body question and the space needed to a far greater extent than they did in the past, and in side entrance cars the width of the entrance is generally about 22 inches, far enough towards the front to permit the door to be opened wide without interfering with the rear mud guards. In the shaft drive types of cars the sprocket wheel fender is absent and the side entrance is unobstructed. These improvements naturally indicate an increased wheelbase over cars in the past, and the new drop frame idea has permitted the body makers to drop the sills of the side entrances in the average about six inches, without interfering with the spring play, which is about five inches in the good examples of cars.

Town Car Body Work.—In town car bodies and bodies for taxicabs, the driver's foot room is reduced to the minimum. The motors are made as short as possible, and the wheelbase is made within a hundred inches, yet even so the side entrance is provided with a wide door and the space for the occupants is roomy, with spacious seats, while easy riding qualities are assured through having the seat to the front of the rear axle.

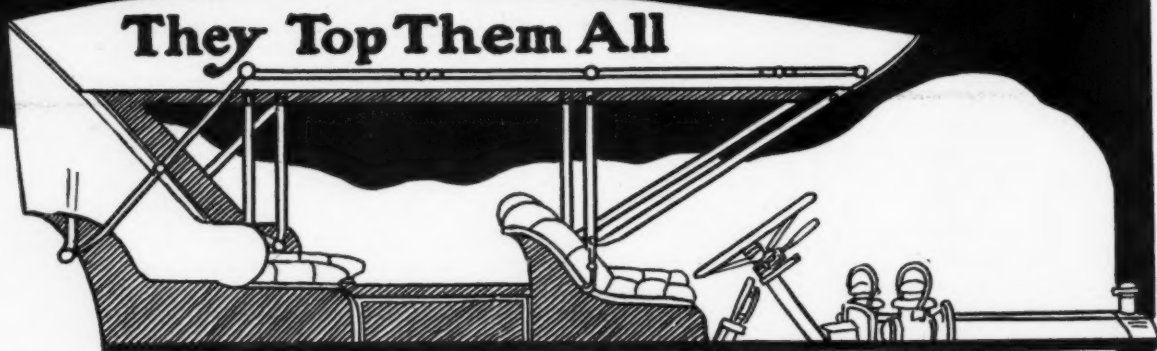
When reference is had to artistic effect and distinctive elegance, it would be a fallacy to assume that the straight line types of bodies are at the expense of art, and while it is impossible to say that art cannot exist without utility, it is a fair assumption that utility does not exist to the despair of art. These requisites can reside in harmony, and they do. The modern body maker has solved this difficult problem, and it will not be possible to charge him with spreading out too thin because he has made a residence for symmetry in all the cars from the runabout type to the most luxurious types of town cars.

Materials Used in Body Work.—These have changed but little in the last two or three years, unless it is to note a more extended use of sheet steel. In some cases this sheet steel is aluminum coated or otherwise suitably protected as against the formation of oxides. At all events, metal bodies are looked upon with much favor; they are very prevalent, and aluminum is still used extensively. The framing work is invariably of wood and the center of gravity is held extremely low. Coming down to the finish proper, there are two fundamental ideas, one of which takes into account painting along lines consistent with machinery practices in which pure lead and zinc ground in pure linseed oil form the basis, while the effects are due to color. If more than the natural luster is desired in this class of finished work, the requisite quantity of varnish is added. A high finish can result from this practice, and bodies so treated will stand a vast amount of washing and rough usage.

For the more costly types of bodies in which the finish is to be the limit of the carriage maker's art, the old standard practice is maintained, stopping off at from 18 to 21 separate applications of finish. The upholstery in the better class of bodies is in hand buff leather of the best selections, with occasional examples in suitable cloth fabrics, notably in town cars. For the less expensive types of cars machine buff cowhide obtains.

MUTTY'S TOP FABRICS

They Top Them All



Mutty Fabrics Are Quality Fabrics in Every Way No Expense Is Spared to Have Them the Best That Experience and Skill Can Make.

Our Mackintoshes Cloths

are made up from the finest imported and domestic fabrics. Our colors are the fastest that can be dyed.

Our "Excelsior" Grade Auto Leathers

are soft, pliable and absolutely water-proof. They will not separate and are the **ONLY ONES** that won't. We go further than the mere claim and give you a guarantee that they won't. **INSIST ON "Excelsior" Grade Fabrics** because they are right, stay right and are guaranteed right.

Our 15-L "Excelsior" Mohair

the acknowledged high-grade top cloth, has many imitators but **NO EQUALS**. Try it.

Send for samples and we will show you why it pays to use Mutty Top Fabrics. WRITE TO US TO-DAY

L. J. MUTTY CO.

Boston, Mass.

MASURY

SUPERFINE

AUTOMOBILE COLORS



ALL COLORS

AND

VARNISHES

BRILLIANT FINISH

MANUFACTURED BY

JOHN W. MASURY & SON

NEW YORK

CHICAGO - ST. LOUIS - MINNEAPOLIS

ESTABLISHED 1855

We have fifteen Stylish and Comfortable Automobile Touring Car Bodies made for The Royal Tourist Cars in a thoroughly faithful manner, upholstered in first-class Dark Green Morocco Finish Leather, all ready to set upon any Chassis—that they will fit. Dimensions as follows:

Front Seat, width outside 45"; Rear Seat, width outside, 55"; Body for 36" Chassis.

These Bodies are left in our hands in such a manner that we can offer them at an extremely attractive price. Additional dimensions will be furnished on application and prompt attention given to all inquiries.

(Signed) THE CHARLES WING CO.,

AMESBURY, MASS., U. S. A.



NEW YORK CITY
450 Broome St.

CHICAGO, ILL.
237 Fifth Ave.

FASTENERS

All styles and sizes for AUTOMOBILES. Now used on all the leading Motor Cars. Prompt Deliveries. Write for prices.

UNITED STATES FASTENER COMPANY

Manufacturers of Snap Fasteners and Metal Goods.
95 MILK STREET, BOSTON, MASS.

BODIES

High Grade Limousine, Landauette, Touring and Runabout Bodies.
Demi-Limousine and Cape Tops.

HUME CARRIAGE CO., 66 Stanhope St., Boston

TOPS
THAT FIT

AUTOMOBILE TOPS

PROMPT
DELIVERY

Looks Well

Fits Well

and

Wears Well

That's a KING TOP

A postal stating make of car will bring you samples and quotations free of any charges.

The King Top Mfg. Co., Dayton, O.

CHASE AUTO TOP FABRICS

HIGH GRADE RUBBER and CHASE LEATHER
in Single and Double Texture

MACKINTOSH CLOTHS

All Popular Materials Unequalled Quality Coating and Proofing

Write for samples

L. C. CHASE & CO., BOSTON, NEW YORK, CHICAGO, SAN FRANCISCO

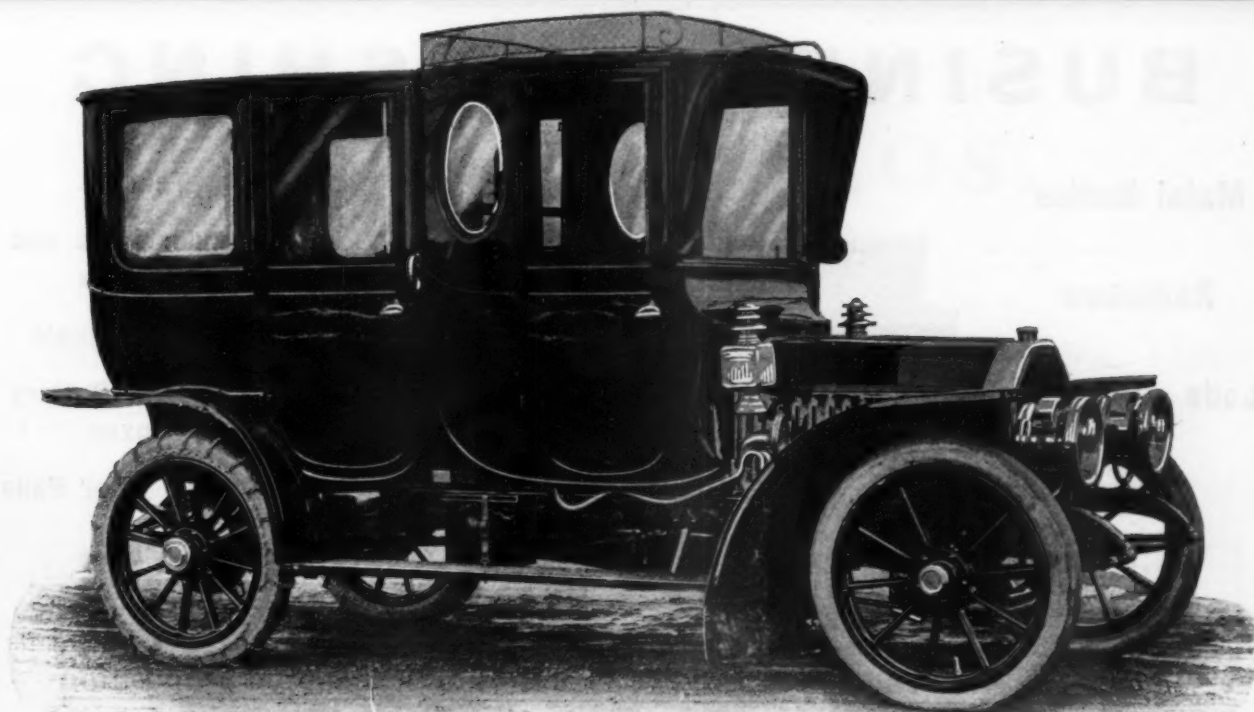
JAMES N. LEITCH COMPANY
(Incorporated)

HIGH-GRADE
WOOD and ALUMINUM

Automobile Bodies

AMESBURY, MASS.

AUTO BODIES
SINCE 1898



J. B. JUDKINS & SONS COMPANY

LIMOUSINE, LANDAULET & TOURING

... BODIES ...

Established 1857

MERRIMAC, MASS.

Don't be
"easy"

and pay a
large price
for what
should be
a high grade
TOP or
SLIP COVER
and allow
the maker to
furnish an
unknown
material to
increase
his profits.

SPECIFY
and OBTAIN

Pantasote

the material
of recognized
superiority,
as the
appearance
of, and the
protection
afforded
by a top
are entirely
dependent
on the
quality of
TOP MATERIAL

Samples at our Exhibit

11 Broadway
New York

THE PANTASOTE CO.

Fisher Bldg.
Chicago

BUSINESS RUSHING

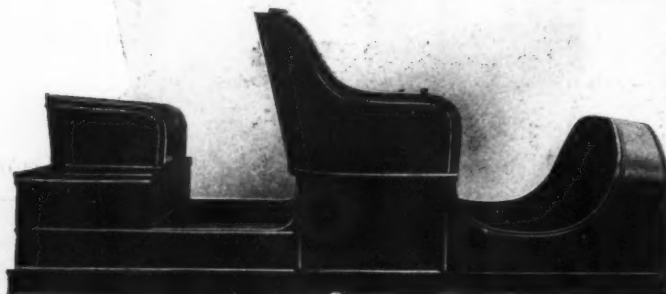
Metal Bodies

Radiators

Hoods

Dashes

Tanks



HAYES MFG. CO.

Fenders

Fender Irons and
Sockets

Under Bonnets

Tool and Battery
Boxes

Garage Floor Pans

METAL BODY

We have several Fenders for standard makes of cars, and good proposition
to dealers and repair men. Also Hoods, Tanks, Dashes, etc.

Write for catalogue of Metal Tool and Battery Boxes. Several sizes carried in stock

HAYES MFG. CO.

430-450 Maybury Grand Ave.

DETROIT



Ask for Copy of Our Catalogue
UNEEED IT

BRASS SPECIALTIES for the AUTO

ABSOLUTELY THE FINEST MADE



Ask for Copy of Our Catalogue
UNEEED IT



MANUFACTURED BY
THE G. W. J. MURPHY COMPANY

MERRIMAC
Mass., U.S.A.



MILLER BROS.

AMESBURY, MASS.

Builders of Exclusive Designs of Automobile Bodies, Limousines, Landaulettes, Taxicabs, Touring Cars and Runabouts, in either Wood or Metal Construction

IN THE WHITE OR FINISHED COMPLETE

High Grade Work at Reasonable Prices
and Prompt Deliveries Guaranteed

Estimates furnished on Special Designs

EVERY AUTOMOBILE AT THE SHOW

Will sooner or later be groomed with Cleanola



Nothing like Cleanola for cleaning and polishing all varnished surfaces. Removes mud stains and rain spots. Covers varnish cracks and scratches. Leaves hard, lustrous surface; Cleanola can be used

Used by principal Railroads and Palace Car Companies.



CLEANS, POLISHES,
RENEWES, PRESERVES

with equally good results on Leather Tops and Seats. Most perfect cleaning compound for all varnished surfaces and the only one free from alkali or acid. Renewes and lengthens life of the varnish.

25c. can sent as sample for 10c. postage and dealer's name.

THE CLEANOLA CO.

FULTON BUILDING

Dept. C

PITTSBURG, P A

TOPS
AUTOMOBILE
\$14.00 AND UPWARDS
Write for Catalogue and Prices
BUOB & SCHEU 1555 Court Street
Cincinnati, Ohio

For your next lot of
BODIES
it will be to your advantage to see
what we can do for you
The Barndt-Johnston Auto Supply Co.
COLUMBUS, OHIO

ASHTABULA
The Oldest Manufacturers
of Bow Sockets in
the World
**THE ASHTABULA
BOW SOCKET
COMPANY**
ASHTABULA, OHIO

CHAS. ABRESCH CO.
Limousine Bodies
TO ORDER
Milwaukee, Wis.

**Automobile and Vehicle
BOWS**
THE ABOVE ARE THE
DIFFERENT SHAPES
WE MAKE
S. N. BROWN & COMPANY, Dayton, O.

The Complete Motorist
No theory, but all about an automobile—its history; its mechanism and how to select and run it. By A. B. FILSON YOUNG. 328 pages. profusely illustrated. Bound in cloth. Price, \$3.50. Address The Automobile, 231-241 West 39th St., New York.

Established 1834
J. M. QUINBY & CO.
OF NEWARK, N. J.
**The Pioneer Automobile
Body Builders of America**
have perfected and patented methods of constructing **ALUMINUM BODIES** that make them the lightest, strongest and most durable produced in the world
QUINBY BODIES AND EQUIPMENTS, on the best foreign and American cars, have occupied leading places in all the prominent shows for the past seven years, and our trademark on any car stands for the highest degree of perfection in automobile body construction.
Catalogues, describing the **QUINBY** methods and showing the various designs of enclosed and touring bodies, upon application.

**LUCAS
"AUTO-KLEAN"**

Preserves the gloss and beauty of your automobile as nothing else can. Keeps the body, finished parts and leather parts as bright as when new.

Unlike ordinary Automobile Soaps and Polishes, "AUTO-KLEAN" contains no acid or alkali to deaden the gloss and destroy the finish. Positively no grit to scratch or discolor the finest finish, as it is put up in **DUST-PROOF CANS**.

"AUTO-KLEAN" removes all dust, dirt, grease, finger marks, cloudiness and mud stains, and does not leave the surface sticky or gummy, but bright and brilliant like new.

Indispensable to Motorists

Nothing on the market to compare with it. Insist on the genuine. Don't be an easy mark and accept something "just as good"—it isn't.

PRICES

Large dust-proof can (garage size) each	\$2.50
Medium " " for carrying in auto	1.00
Small " "	.50

Liberal Discounts to Dealers



Substitutes are dangerous at any price

For sale by Leading Supply Dealers and Garages, or write us for a list of dealers and our booklet containing full directions.

JOHN LUCAS & CO.

New York Philadelphia
Chicago Boston

THE
**Blue Ribbon Auto
& Carriage
Company**

130-170 Cannon St., Bridgeport, Conn.

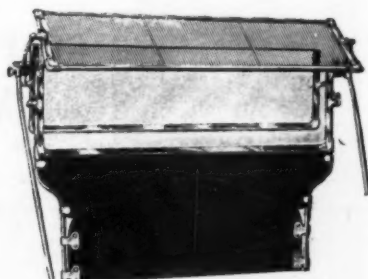
Builders of High Grade
AUTOMOBILE BODIES

FOR
MANUFACTURERS
DEALERS
INDIVIDUAL
OWNERS



THIS
MAGNIFICENT
SHIELD
WITH NINE
OTHERS

Will be on exhibition at
Grand Central Palace
and Madison Square
Garden Shows

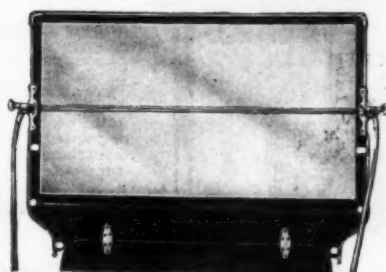


No. 3. Triple Combination

8
Models



8
Models



No. 5. Wood Frame

CALL FOR OUR
CATALOG
AND SEE THE
LARGEST
SHIELD DISPLAY
EVER MADE
DON'T MISS US
**THE TROY CARRIAGE
SUN SHADE CO.
DEPT. 5
TROY, O.**

"LUXURY" Auxiliary Seats

For AUTOMOBILES, MOTOR
BOATS, CARRIAGES, ETC.

THE most comfortable and convenient devices ever constructed for the purpose. Can be inserted or detached in a moment. Each seat rotates on its own bracket. Seats hinged to back so that when folded they are out of the way but ready for instant use when required; or, when desired, may be lifted out and left in a convenient place until wanted for use again.



Style A



Style A, folded



Style B



Dovetail
Socket



Style B, folded

Richly and voluptuously upholstered and delightfully comfortable. Built to last as long as the automobile or the boat.
Increase the capacity of the automobile and add to the enjoyment of all without crowding or discomfort.

The finest and best auxiliary seats ever manufactured. No others can compare with them. Patents pending.

Made in two styles — A and B; each style in two different sizes.

Sent anywhere in the United States, freight or express prepaid east of the Mississippi.

Write us at once for prices and full particulars.

GRAVES & CONGDON
AMESBURY, MASS.

LOCKE & COMPANY AUTOMOBILE BODIES

¶ are now taking orders for early deliveries of Limousines, Landaulets, and other forms of closed bodies.

¶ Without parallel in this country or abroad.

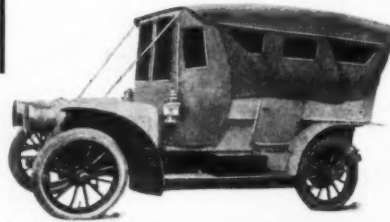
¶ Combining extreme elegance, most refined designs and unexcelled durability.

¶ Not low in price, but the highest grade of work and finish that can be produced.

218-220 WEST 84th ST., NEW YORK

Telephone, 3258 Riverside

AUTOMOBILE DEALERS—Read This



Are you paying a high price for your auto tops? Are you getting a top that looks cheap and unshapely in a few weeks? If so, try our tops. Only best material used, and built strong and durable. 20 years, experience and a guarantee to satisfy you. Our customers are our best boosters. Our prices will surprise you. Write at once for catalog samples and prices.

WARNER POLE & TOP CO.

1652 Central Ave., Cincinnati, Ohio.

The COLLINS No. 400 All Brass Shield

IN FOLDED POSITION



WOOD PART—Mahogany finish or solid oak. Solid mahogany or solid walnut at small advance in price.

FRAME—Solid brass tubing.

GLASS—Best quality extra heavy polished plate. Where glass meet edges are bound with 3-8 slot brass.

BASE BOARD Piano finish. We make four other styles of shields. Automobile tops and complete special bodies ready to mount Limousine, Commercial, &c.

Let us know your requirements and secure prices.

G. A. COLLINS & SON

Established 1839

Akron, Ohio

Krausz's Complete Automobile Record



By a unique and ingenious arrangement of columns, enables the motorist to keep a convenient and accurate account of expenses, dates, running, and other items. The record is kept under the following headings: gasoline, lubricating oils, carbide and kerosene, charging batteries, repairs (tires, machinery, body), replacements, other expenses, place of departure, destination, distance run, speed in miles (highest, average), name of driver, occupants of car, remarks, garage expenses, chauffeur's salary, railroad and other hauling, fines, etc. Special arrangements for ascertaining at a glance the totals of expenses and runs by day and week, brought forward so as to give the grand total for any definite time. Also a speed table and the automobile laws of all the States. The only Complete Automobile Record on the market. The book is album-shaped, substantially and attractively bound, and should be in the hands of every motorist.

A USEFUL COMPANION FOR EVERY AUTOMOBILIST

Full Leather Binding, \$1.00

Send all orders to **THE AUTOMOBILE, Book Dept.**
FLATIRON BLDG., NEW YORK

OWNERS OF AUTOMOBILES
SHOULD HAVE

SELF-PROPELLED VEHICLES

IN THEIR LIBRARIES

IT'S a new book by J. E. Homans, A.M., and tells the whole story. It explains in simple, non-technical language the mechanism and management of every type of automobile. 610 pages; 500 illustrations; complete diagrams; ready reference index. \$2.00.

Address

Book Dept., **CLASS JOURNAL CO.**
231-241 W. 39th St., New York

AUTOMOBILE BODIES



In Both
Aluminum
and
Wood Panels

Limousine,
Landaulet,
Taxicab and
Touring Cars
in the white
or painted
and trimmed
complete.

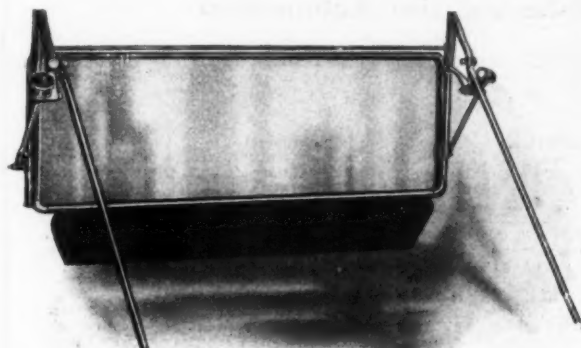
Also
Automobile
Tops

Schubert Bros. Gear Co. 44 Cedar Street
ONEIDA, N.Y.



WIND SHIELDS

TWO STYLES—BOTH WINNERS



"HARTFORD"

The HARTFORD DIVIDED DROP SHIELD

FROM ITS

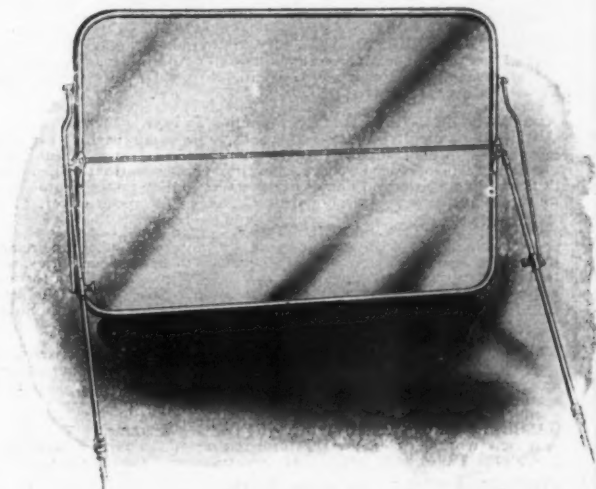
MECHANICAL CONSTRUCTION AND THE MATERIALS
USED MAKE IT THE BEST PROPOSITION ON
THE MARKET. PRICE ATTACHED TO
CAR AT YOUR GARAGE,

\$35.00

The LINCOLN FOLDING SHIELD

IS A SOLID, SUBSTANTIAL AND ATTRACTIVE SHIELD
THAT WILL NOT RATTLE. PRICE ATTACHED
TO CAR AT YOUR GARAGE,

\$30.00



"LINCOLN"

BOTH THESE SHIELDS ARE GUARANTEED IN EVERY PARTICULAR, AND WE WILL
SHIP UPON RECEIPT OF THE PRICE

WE USE ONLY THE BEST MAHOGANY BASE-BOARDS AND FRENCH PLATE GLASS, SET IN
HIGHLY FINISHED BRASS TUBING IN SUCH A MANNER THAT IT
IS IMPOSSIBLE FOR IT TO RATTLE

THESE SHIELDS WILL FIT ANY CAR

SPECIFY WHETHER THE SHIELD IS TO
FIT A CURVED OR STRAIGHT DASH

WE MANUFACTURE AND SELL MORE WIND SHIELDS THAN ANY OTHER JOBBERS IN NEW ENGLAND
WE ARE IN POSITION TO TAKE CARE OF YOUR EVERY REQUIREMENT ON
AUTOMOBILE SUPPLIES. GET OUR QUOTATIONS
BEFORE PLACING YOUR ORDERS

BI-MOTOR EQUIPMENT CO.

177 PORTLAND ST.

BOSTON, MASS.

BOOKS AND PUBLICATIONS

on Subjects of Interest to Those Who Make and Use Automobiles

A. B. C. OF MOTORING. By Sigmund Krausz.

A manual of practical information for layman, auto novice and motorist, containing dictionary of terms, types of cars, anatomy of the automobile, motors, carburetor, ignition, cooling, tires, transmission, etc. Care of the machine, art of driving, troubles of the road, etiquette of automobilism, racing rules and statistics, foreign travel, clubs, manufacturers, trade papers, speed tables, and complete digest of motoring laws of thirty-five States and names of those having no laws. Morocco cover, \$2.00.

ACCIDENTS AND EMERGENCIES. By C. W. Dulles, M.D.

A convenient little manual, containing suggestions and instructions for the care of sick or injured persons in emergencies. It covers such subjects as drowning, removing foreign bodies from the eye or ear, burns and scalds, dislocations and fractures, wounds and hemorrhages, poisons and poisonous plants, supplies for emergencies. Size 5 by 7 1-2. Pages, 209. With illustrations. Canvas boards, \$1.00.

ACETYLENE. By F. H. Leeds and W. J. A. Butterfield.

A useful, practical handbook on the production, purification and subsequent treatment of acetylene for the development of light, heat, and power. Size, 5 1-2 by 8. Pages, 276. With illustrations and tables. Cloth bound. \$2.00. Postage, 10 cents additional.

AUTOMOBILE CATECHISM. By Forrest R. Jones, M.E.

This is a thoroughly practical, modern work, published in pocketbook form. Size, 4 1-2 by 7. Pages, 134. With drawings. Genuine Morocco cover, \$2.00.

AUTOMOBILE DICTIONARY. By Sigmund Krausz.

An American pocket reference book, containing automobile technical terms in English, French and German. Sizes, 4 1-4 by 6 1-4. Pages, 129. Flexible leather, with flap, \$2.00.

AUTOMOBILE RECORD. By Sigmund Krausz.

Expense account of fifty-two weeks, with columns for cost of gasoline, carbide, kerosene, repairs, replacements, daily runs, chauffeur's salary, garage expenses, speed record, starting point, destination, motoring laws of thirty-five States and names of others having no laws. Totals of expenses and runs for any period shown at a glance. Morocco cover, \$1.00.

AUTOMOBILE TRADE DIRECTORY.

A classified list of the manufacturers of automobiles, commercial vehicles, motor boats, motor cycles and of all makers of parts, accessories, machinery, tools and automobile shop equipment. Also tables and data for automobile engineers and other pertinent information. Size, 7 by 10. Pages, 466. Published quarterly. Subscription price, \$5.00 per year. Single copies \$1.50, postpaid.

GAS, GASOLINE AND OIL ENGINES. By Gardner D. Hiscox, M.E.

A practical work on gas, gasoline, kerosene, and crude petroleum engines and producer gas plants. Size, 6 by 9 1-2. Pages, 442. With 351 illustrations. Cloth bound \$2.50.

GASOLINE ENGINE IGNITION. By E. J. Williams.

A new work written for the information of the novice especially. Size, 5 by 7. Pages, 94. With 37 illustrations. Cloth bound, \$1.00.

INDUCTION COILS. By H. S. Norris.

A practical work on how to make, use and repair coils. Size, 4 3-4 by 6 3-4. Pages, 269. With 78 illustrations. Cloth, \$1.00.

LUBRICATING OILS, FATS AND GREASES. By George H. Hurst.

A book written with the object of supplying oil dealers and users with information as to the various oils which are used for the purpose of lubricating machinery. Size, 5 1-2 by 3-4. Pages, 317. With illustrations and tables. Cloth bound, \$3.00. Postage, 10 cents additional.

MODERN GAS AND OIL ENGINES. By Frederick Grover, M.I.M.E.

A reference book intended chiefly for the information of mechanical draftsmen engaged in the design of internal combustion engines. Size, 5 by 7 1-2. Pages, 372. With 178 illustrations, \$2.00.

MOTORS AND MOTOR DRIVING. By A. C. Harmsworth.

This is one of the English series of works on sports known as the Badminton Library, and is intended to include the whole field of automobilism in an interesting discussion for the information of the novice. Size, 5 1-2 by 7 1-2. Pages, 456. With many illustrations. Decorated covers, \$3.50.

MOTORS AND MOTORING. By H. J. Spooner, C. E.

A very instructive little book, dealing chiefly with the how and why of motor construction and operation. Size, 5 by 7 1-4. Pages, 99. With 20 illustrations. Cloth boards, \$1.00.

MOTOR IGNITION APPLIANCES. By T. H. Hawley.

A treatise on the application of electricity in the production of the ignition spark in internal combustion motors. Size, 6 by 9. Pages, 137. With 34 drawings. Cloth bound, \$1.50.

MOTOR POCKETBOOK. By Mervyn O'Gorman, M.I.E.E.

A very useful reference book, written for the owner and driver. Worth a place in every automobile library. Size, 4 1-2 by 6 1-2. Pages, 387. With many drawings. Flexible leather, \$3.00.

MOTOR VEHICLES AND MOTORS. By W. Worby Beaumont.

It treats entirely of modern machines and methods, devoting chapters to the gasoline touring car, English, Continental and American. Size, 8 by 11. Pages, 677. With 500 illustrations. Cloth bound, \$10.00. Express charges additional.

MOTOR VEHICLE FOR BUSINESS PURPOSES. By A. J. Wallis Taylor.

A practical handbook for those interested in the transport of passengers and freight. Size, 5 1-2 by 8. Pages, 298. With 138 illustrations. Cloth bound, \$3.50.

MY AUTOMOBILE.

A well-bound blank book, in which to record dates, runs, time, distances, weather, roads, cost of repairs, fuel, entertaining, and all the other information about tours that interests the autoist. Size, 4 3-4 by 7. Pages, about 270. Cloth bound, with pocket for map, \$1.00.

PETROL MOTORS AND MOTOR CARS. By T. Hyler White, A.M.I.M.E.

A handbook for engineers, designers and draftsmen. Size, 5 1-4 by 7 3-4. Pages, 187. With 44 drawings. Cloth bound, \$1.50.

SELF-PROPELLED VEHICLES. By James E. Homans, A.M.

A practical treatise on the theory, construction, operation, care and management of all forms of automobiles, with upwards of 500 illustrations and diagrams. Size, 5 1-2 by 8 1-2. Pages, 652. With drawings and half-tones. Cloth bound, \$2.00.

SMALL ACCUMULATORS. By P. Marshall.

An elementary handbook for students and beginners, discussing theory and practice in the construction of small storage batteries. Size, 4 3-4 by 6 1-2. Pages, 80. Cloth boards, 50 cents.

THE AUTOMOBILIST'S DAILY RECORD OF RUNS. By Jarrott and Letts.

A blank book, with ruled pages, in which to record the log of any run made. Size, 5 by 7 1-2. Pages, about 300. Cloth, stiff covers, \$1.00.

THE AUTOMOBILE HANDBOOK. By L. Elliot Brookes.

This work was written to supply practical information to automobile owners and operators, with additional information of value to the automobile mechanic. Size, 4 1-2 by 6 3-4. Pages, 320. Over 100 illustrations. Popular edition, full leather, limp, \$1.50.

THE AUTOMOBILE POCKETBOOK. By E. W. Roberts, M.E.

The purpose of the author in writing this book has been to place before the designer and operator, in a concise manner, a few general notes on the design and operation of the gasoline automobile. Size, 3 1-2 by 5 1-4. Pages, 329. With many drawings. Flexible leather, red edges, \$1.50.

THE COMPLETE MOTORIST. By A. B. Filson Young.

A practical volume devoted to the history, construction, use and care of motor cars, and to the subject of motoring in America. Size, 5 3-4 by 8 1-2. Pages, 372. With many illustrations. Cloth bound, \$3.00.

THE COMPLETE MOTORIST. By A. B. Filson Young.

This is an American edition of an English book, which is described in a subtitle as being an account of the evolution and construction of the modern motor car. Size, 5 1-2 by 9. Pages, 338. With many illustrations. Cloth bound, \$3.50.

THE GAS AND OIL ENGINE. By Dugald Clark, M.I.C.E.

It discusses the theory of the gas engine and the general application of that theory in practice, and deals extensively with modern gas engines and with the oil engine. Size, 5 1-2 by 8 1-2. Pages, 588. With 288 drawings. Cloth bound, \$4.00.

THE GAS ENGINE. By Frederick Remsen Hutton, E.M., Ph.D., Professor of Mechanical Engineering in Columbia University.

A treatise on the internal-combustion engine using gas, gasoline, kerosene, or other hydrocarbon as source of energy. Pages, 483. With 300 drawings. Cloth bound, \$5.00.

THE GAS ENGINE HANDBOOK. By E. W. Roberts, M.E.

A very useful manual of information about American practice in the construction and operation of stationary gas engines, for the use of the designer and engineer. Size, 3 1-2 by 5 1-4. Pages, 264. Flexible covers, \$1.50.

THE HAPPY MOTORIST. By A. B. Filson Young.

The author, who is a well-known English writer, describes the purpose of the book as "an introduction to the use and enjoyment of the motor car." Size, 5 1-4 by 7 3-4. Pages, 230. Decorated covers, \$1.50.

THE OFFICIAL AUTOMOBILE BLUE BOOK. Four Complete Volumes.

Published under the official endorsement of the A. A. A.
No. 1.—New York State-Canadian Section, with principal trunk lines to and from the Middle West.

No. 2.—New England States Section, with extension routes into the Provinces.

No. 3.—New Jersey, Pennsylvania Delaware, Maryland, District of Columbia and Virginia Section, with principal trunk lines to and from the Middle West.

No. 4.—Middle West Section, covering Ohio, Indiana, Southern Michigan, upper and central Illinois and lower Wisconsin.

Over 70,000 miles of American roads carefully described and illustrated with superior maps. Each volume, complete in itself leather bound \$2.50 postpaid.

THE PRACTICAL GAS ENGINEER. By E. W. Longanecker.

A manual of practical instruction on stationary internal combustion engines. Size, 4 by 6 1-2. Pages, 143. Without illustrations. Cloth boards, \$1.00.

FOR SALE BY THE CLASS JOURNAL COMPANY, Publishers of "THE AUTOMOBILE" NEW YORK
231-241 West 39th Street

Chassis Section



INCLUDING
Pressed Steel, Drop Forgings, Axles, Springs, Levers,
Running-Boards, Steering-Columns, Steering-
Wheels, Bolts, Nuts, Chains, etc.

LOOK FOR OUR TRADE
MARK



WE GUARANTEE
SATISFACTION
OR MONEY REFUNDED

SUPPLEMENTARY SPIRAL SPRINGS

**Eliminate all Spring Troubles
Insure Comfort and Safety
Save Repairs---Save Tires**

Supplementary Spiral Springs commence where the side springs stop—any inequality in the road calls the **Supplementary Spiral Springs** into instant action, relieving the car and its occupants from jolts and jars so unpleasant to passengers, trying to the mechanism and disastrous to the side springs.

Supplementary Spiral Springs add very much to your comfort and reduce repair bills; the saving in repairs alone in a year will repay their cost many times over.

Supplementary Spiral Springs (thousands now in use) are applicable to all cars (see illustration in margin), and are efficient on all types of Runabouts, Touring Cars, Limousines or Heavy Trucks, and cost about one-half the price asked for complicated and inefficient devices.

Supplementary Spiral Springs are also furnished in combination with specially constructed full-elliptic or semi-elliptic double-leaf side springs, an ideal spring equipment. See illustrations below. Correspondence with auto-manufacturers invited. Send for illustrated booklet and testimonials—free on request.

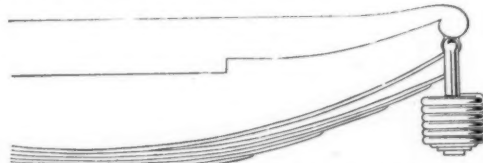
Supplementary Spiral Spring Company

Main Office and Factory, 4529 Delmar Ave., St. Louis, Mo., U. S. A.
NEW YORK CHICAGO

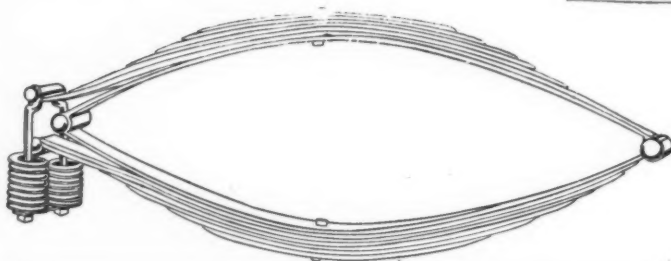
BOSTON, F. Shirley Boyd, 889 Boylston St. SAN FRANCISCO, Frank O. Renstrom Co.,
424 Stanyan St. TORONTO, CANADA, The T. Eaton Co., 190 Yonge St.



Front Double Leaf Semi-Elliptic Combination



Rear Double Leaf Semi-Elliptic Combination



Full Elliptic Double Leaf Combination

Rear Springs



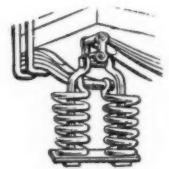
No. 1
Curved Hanger



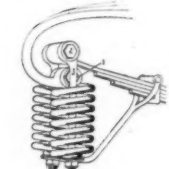
No. 2
Outside hanger, carrying spring on stud end



No. 3
Full Elliptic



No. 4
Platform Spring

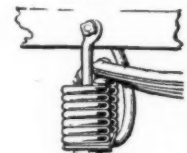


No. 7
Scroll End Spring

Front Springs



No. 5
Shackles attached direct to spring above spring end



No. 6
Curved Hanger. Shackles attached to hanger below spring end



in
th
f
c
c
to
(
f
c
p
l
o
a
p
is
in
in

t
th
a
p
th
f
l
ta
T
r
m
c

u
th
it
in
es
p
w
fe
ab
an
In
w
ri
tic
ab
m



IN the automobile it would not be out of place to refer to the frame as a chassis, nor is it a stretch of the imagination to include the accessories of a frame as springs, etc., together with the axles and the wheels on which they roll. It seemed far fetching to include the power plant, and so it has been discussed separately, and the wheels, the products of an ancient craft, are excluded from this discussion, as they are entitled to separate consideration.

For the present, confining the discussion to the chassis proper (frame), it may not be out of place to lay stress upon the features of the most importance, but the least discernible. A casual observer from the paint that covers the frame might pronounce the frame as good, if perchance the finish makes it look good. The modern automobile maker has the happy faculty of seeing things as they are, and frames of cars as they abound are no longer of cold pressed, mild Bessemer plates. It is the present practice to use fine grades of steel, the quality of which is fairly represented in the mere statement that it will stand in the cold bending test 180°, and, flattened down, without showing signs of distress under a twenty to one glass.

Prevailing Shapes in Frames.—The channel section seems to spell finality, but wood has its strong points. Mathematically, this section holds forth the promise requisite to the occasion, and, practically, this same section lends itself readily to the process. Because of the fine materials and the willingness of the channel section to conform to intricate shapes, the drop frame has come into vogue, thereby rendering it possible to lower the center of gravity, besides facilitating entrance and egress of the car. This same readiness to conform to shapes renders it feasible to fashion the lateral members in a manner agreeable to machinery equipment.

The most recent products are to the gradual elimination of castings at any point on the chassis, and in some of the examples it is to note the presence of pressed steel instead of parts by the drop forging process. The object of resorting to the use of pressed steel fittings instead of forgings is with a view to decreasing cost without suffering a diminution of quality. In the abstract steel plates are of greater strength and in better condition than drop forgings. In the process the pressed steel parts would retain their quality, assuming the riveting is given a due measure of attention. That the builders of cars are fully alive to the advantages of the respective methods is a matter that can be easily set-

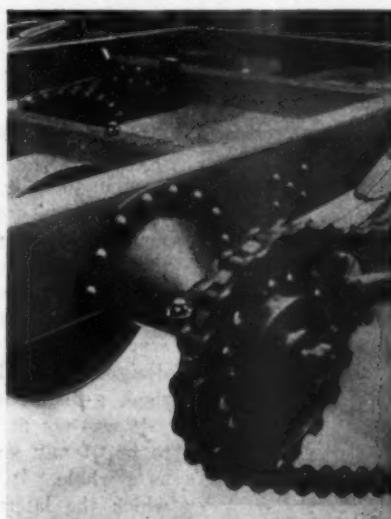
tled by merely glancing at the products. They use drop forgings where they will best serve the purpose, and they resort to the use of pressed steel to a marvelous extent.

Spring Suspension in Automobiles.—There is no one detail of such great importance or so difficult to manage as that of evolving easy riding qualities and longevity of the supple members. The quickest way to break a piece of steel is to subject it to alternating deflections in reverse. Springs have to sustain under these conditions, especially springs in automobiles. They have to be worked to a point near the elastic limit to engender easy riding qualities, hence kinetic ability must be the marked characteristic of the steel employed for this purpose. The improvements wrought in spring steel and in the treatment of the same can scarcely be adequately described in a word picture. In the old days steel that would stand up to half a million of vibrations under the stress of half the elastic limit was said to be good enough to place in a safe deposit vault, but the automobile makers of to-day are making strenuous efforts to exceed one million six hundred thousand vibrations at half the elastic limit. The value stated is extremely high.

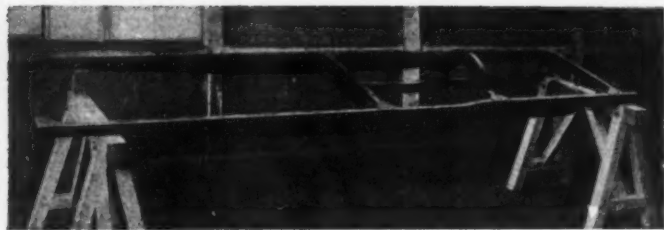
It is now a fairly well established fact that the quality of steel, the features of design, and the mode of treatment are the factors of importance rather than the mere question of the types of the springs adopted. Types of springs can be adopted to suit the general features of cars, and the level platform, so much to be desired, will mostly depend upon the other factors.

Practice in Axle Construction.—Front axles are very largely of the "I" section, while knuckles are of divers designs, as Elliot, Lemoyne, Mercedes, etc., with splendid proportions of the steering mechanisms and a special reference not only to liberal bearing surfaces, but adequate means of lubrication. When reference is had to rear axles, the types diverge, depending upon shaft or side chain drives. In the cars utilizing the side chain drive, the "I" section axle is in full force, and it is not uncommon to observe the distance rods of the same section, primarily because of its strength.

With live rear axles there is still a considerable amount of featuring in various directions, but it is plain to be seen that all designers are in favor of increasing the ground clearance under the different housings and increasing stability by the use of more stable truss rods, if they must be used at all. There is a prejudice in favor of the elimination of truss rods, and there are a few examples of rear axles in which



A Strong Differential Bracket.



A Characteristic Sub Frame.

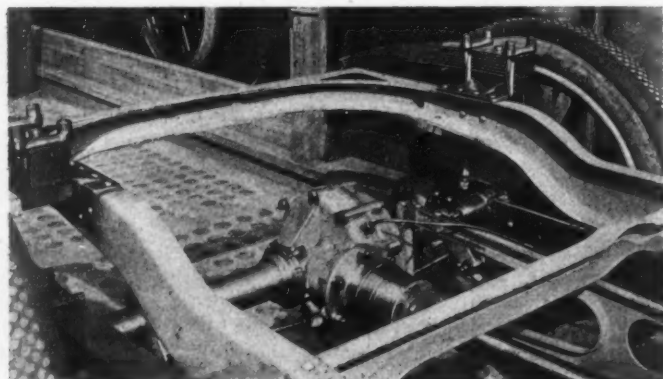
autogenous and electrical welding methods are resorted to with a view to the fashioning of the enlargement of the members to accommodate the differential housings in this class of axles.

Semi-floating types of rear axles seem to be very common, and designers are pretty evenly divided between transmission sets in conjunction with rear axles and the same transmission sets as separate units swung on the frame, excepting in the self-contained power plants, in which the transmission sets are integral therewith. Of materials, it is to note the same degree of improvement along consistent lines.

Some Ruling Dimensions.—The advent of the long wheel-base has brought about specific reforms by way of stiffer frames, an increased number of laterals, and better ties. It is now a fairly established fact that the chassis frame should be relatively heavy, if a level platform is desired. Road inequalities, as they affect the springs, will react with a consequent secondary motion of the lightest series. If the chassis frame is heavier than the parts below the springs, the motion will be imparted to the parts below (axles, wheels, etc.), rather than to the frame itself. The law says "a mass will be diverted from its habitual direction to an extent inversely proportional to the weight," etc. Result, if the axles, wheels, and parts below the springs are lighter than the mass above, the excess motion will be imparted to the series below. The cars of to-day are in harmony with the laws, and the builders of automobiles more nearly understand how to bridle the forces.

Improvements in Materials Demanded by Service.—There is no part of the automobile that has undergone so much change in so short a time as the materials used in the various parts of the chassis. The earlier examples of cars had side members of regular structural shapes, as T's, L's, and, for the heaviest work, channel sections. The material used in these products was substantially mild steel in which the metalloids were held at quite high values. The introduction of the pressed steel frames in irregular channel sections was not at first attended by the utilization of fine material. It was soon found that alignment was conspicuous for its absence after a little road service, because the materials of which the side frames were made had not the requisite rigidity in the first place, and no attempt was made to counteract the ills of sagging.

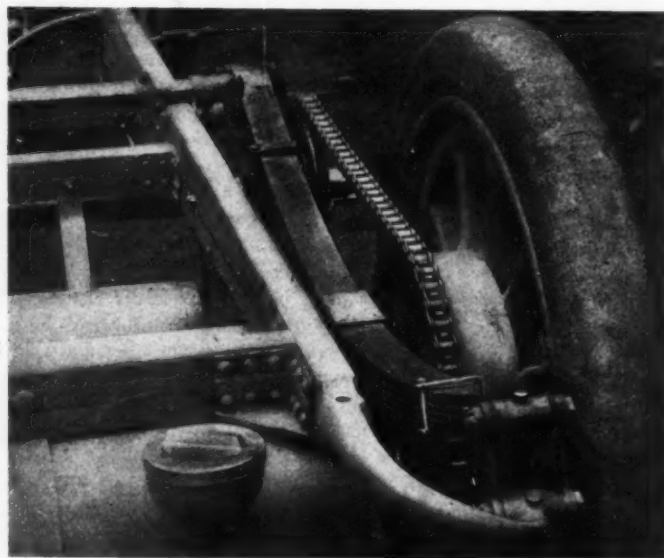
Discriminating designers soon reached the conclusion that special grades of material would be necessary, and that sagging



A Characteristic Drop Frame.

would have to be fortified against by some means or other. Some of the more ingenious of the designers proposed to put an initial sag in the side members by merely shaping them in the press with an upward camber and in the later process subject them to sufficient pressure to bring on a permanent set, incidentally eliminating the upward camber, hence straightening them out. This practice was resorted to in notable cases, and frames so constructed rarely, if ever, gave any trouble at all.

Other improvements were by way of deeper channel sections and a greater width of flanging at critical points, but the greatest gain, aside from the matter of correct design, came from the use of the finer grades of alloy steel. In some notable instances nickel steel, quite low in carbon, was adopted, and silico-manganese products have found a wide application. A goodly number of the frames, however, are the product of spring steel of the low carbon genera. Certainly the materials that would serve well in springs would logically serve as side members, because while it is true that spring steel has certain properties requisite in springs, it is at the same time a product of a high initial rigidity. This is not to say that the conventional spring



Rear Spring Suspension, with Side Chain Drive.

steel of the market as ordinarily used in railroad car springs would be valuable for this purpose.

Some of the best examples of cars employ "government inspected" boiler plate in side frame members. This is, of course, fine material to work, and it seems to stand every test, as well as the exigencies of service. Its underlying characteristic involves the use of fine grades of ore in the O. H. process, limiting carbon to about ten points. There are special lines of side frame material to be had, but it is doubtful if they differ very much from what are generally known as the better grades of flange steel, or, for that matter, of the boiler plate above referred to.

At all events, irrespective of the exact grades of materials used in the different cars, there are none so poor as to support the ordinary grades of steel as found in the cold pressed side members of even two or three years ago. But this is not to say that unsatisfactory service was due to materials even in the majority of cases, since some of the earlier designs looked as if they were fashioned for the specific purpose of failing in service. Of course they were not; the problem was new, and designers lacked experience. A controlling factor was oftentimes a distinctive appearance.

It was not at first supposed that lateral supports would prove to be of any great advantage by way of stiffening the chassis as a whole. It was soon found, however, that the examples in which the lateral members were well designed seemed to do the best work, affording the greatest measure of rigidity.

LARGE SALES AND SMALL PROFIT

with thousands of satisfied customers is our best advertisement, and makes it possible for us to import



The Celebrated Brampton Chain

from ENGLAND (paying Freight and Duty) and sell it at THE SAME PRICE AT WHICH THE OTHER CHAINS ARE SOLD TO AUTOMOBILE MANUFACTURERS, JOBBERS, DEALERS AND OWNERS.

Price Being Equal, Which Would You Prefer? The Best?

Several of the manufacturers now equip their cars with THE BRAMPTON CHAIN. Others will do so, if you will order your car that way. No extra cost to you or the manufacturer.

PRICE THE SAME—QUALITY, THAT'S DIFFERENT

There is an increasing DEMAND for THE BRAMPTON CHAIN and it is now being sold by the live jobbers and dealers throughout this country. Agents wanted in unoccupied territory

WE ARE SOLE U. S. AGENTS. Write for proposition. CATALOG ON REQUEST

CHAS. E. MILLER Manufacturer, Jobber, Exporter and Importer
Main Office: 97-99-101 Reade St., New York

BRANCHES—54th St. and Eighth Ave., New York; 202-204 Columbus Ave., Boston, Mass.; 318-320 North Broad St., Philadelphia, Pa.; 227½-229 Jefferson Avenue, Detroit; 1829 Euclid Avenue, Cleveland, O.; 1392 Bedford Avenue, Brooklyn, N.Y.; 824 Main Street, Buffalo

SEE OUR EXHIBIT AT BOTH NEW YORK AUTOMOBILE SHOWS

The LARGEST AUTOMOBILE SUPPLY HOUSE IN AMERICA

EVERY CAR runs "GOOD" on TIMKEN BEARINGS

That's why all the good cars use them

Look at this list of prominent Motor Cars and Transmission Makers who use **TIMKEN BEARINGS** either altogether or in part.

Peerless Motor Car Co.
Packard Motor Car Co.
F. B. Stearns Co.
Locomobile Co. of America.
E. R. Thomas Motor Co.
Winton Motor Carriage Co.
Lozier Motor Co.
Royal Motor Car Co.
Apperson Bros. Auto. Co.
Austin Auto. Co.
Matheson Motor Car Co.
Olds Motor Works.
Dayton Motor Car Co.
Chalmers-Detroit Motor Co.
Pope Mfg. Co.
Haynes Auto. Co.
H. H. Franklin Mfg. Co.
Premier Motor Mfg. Co.
Electric Vehicle Co.
Nordyke & Marmon Co.
Buick Motor Co.
Dorris Motor Car Co.
Autocar Co.
York Motor Car Co.
Kissel Motor Car Co.
Bartholomew Co.
Acme Motor Car Co.
Speedwell Motor Car Co.
Forest City Motor Car Co.

Colburn Auto. Co.
Atlas Motor Car Co.
Auto Vehicle Co.
Buckeye Mfg. Co.
Bloomstrom Mfg. Co.
Duro Car Mfg. Co.
E. M. F. Co.
Grout Auto. Co.
Hewitt Motor Co.
T. B. Jeffrey & Co.
Oscar Lear Auto. Co.
Midland Motor Co.
Moline Auto. Co.
Marion Motor Car Co.
Mason Motor Car Co.
Smith Auto. Co.
Selden Motor Vehicle
Velie Motor Vehicle Co.
H. E. Wilcox Motor Co.
And many others.

ELECTRICS.

Anderson Electric Co.
Columbus Buggy Co.
Rauch & Lang Carriage Co.
Waverly Co.
C. P. Kimball & Co.
And many others.

There could be no more conclusive proof of merit than this practical endorsement.

ONCE A TIMKEN USER ALWAYS A TIMKEN USER

There's a reason.—Every Manufacturer knows it. Every Dealer should know it. Every Owner will insist on **TIMKEN BEARINGS** if they know it.

See the **TIMKEN EXHIBIT** at the Shows or write direct for illustrated descriptive matter.

We will exhibit—

Grand Central Palace, Dec. 31st-Jan. 7th.
Madison Square Garden, Jan. 16th-Jan. 23rd.
Chicago, Feb. 6th-Feb. 13th.

THE TIMKEN ROLLER BEARING AXLE CO.

CANTON, OHIO

BRANCHES

NEW YORK: 10 East 31st Street

CHICAGO: 429 Wabash Avenue



BALDWIN NEW DETACHABLE CHAIN

has proven itself equal to all conditions of automobile driving.

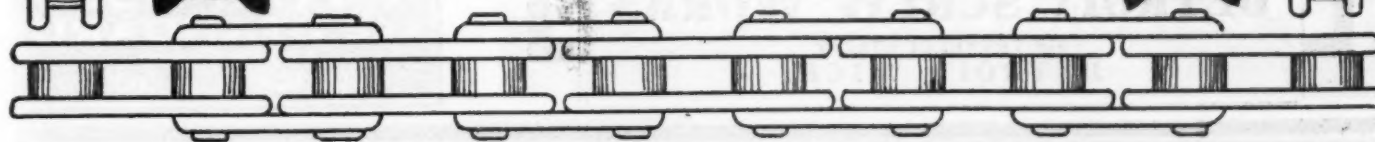
The clips "B" will hold at the highest rates of speed. The tool "C" is furnished with each chain, together with extra clips "B." These clips are as easily handled as the cotter pin. Send for samples before placing the season's business.

SPROCKETS. Let us quote on sprockets in quantities.

The Baldwin Chain & Mfg. Co.

Worcester, Mass.

AGENTS: { H. W. GREENWOOD, 166 Lake St., Chicago, Ill.
H. D. SIMMONS, 1717 Broadway, New York.
M. A. BRYTE, 718 Mission St., San Francisco, Cal.



INSIST ON



SPICER UNIVERSAL JOINTS

BEING ON YOUR CAR BEFORE YOU BUY

The Standard for Strength and Durability

Your Car cannot be The BEST Car without the BEST joints. See that your old car and NEW one is equipped with "SPICER."

Only the very best material is used—Steel drop forgings being used for all parts under stress of Power Transmission. All bearings are hardened and accurately ground, and all parts are interchangeable. Lubrication is practically perfect; joints will outwear the rest of the car.

Send for descriptive circular and full particulars

**SPICER
UNIVERSAL JOINT CO.**
15 Madison Ave.
PLAINFIELD, N. J.

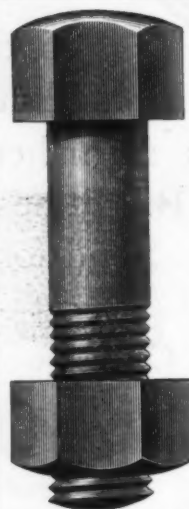
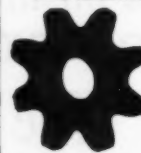
See our exhibit at the Grand Central Palace Show, opening in New York on New Year's Eve.

Far the
BEST
joint in
the world
and used
on the
BEST
Cars



Simple
Efficient
Dust-proof
Oil-tight
Strong
Compact
Inexpensive
Most
Durable



THIRTY YEARSMAKING SCREWS AND
SCREW MACHINE PRODUCTS**OUR SPECIALTY**Automobile Motor and Engine
Parts to A. L. A. M. StandardHardened and Ground
WorkAnything Turned from
Bar*Send us your Blue Prints***DETROIT SCREW WORKS**348 FRANKLIN STREET
DETROIT, MICH.**THE FRENCH MFG. CO.**132 ROBBINS ST
WATERBURY, CONN.
Manufacturers of**SEAMLESS**Brass, Copper,
Bronze and
White
MetalThin
Gauges
Small
Sizes**TUBING****SPECIALTIES:**Irregular Shapes,
Solid Drawn Work and
Hydro-Carbon Lighting Tubing**CULLMAN SPROCKETS**and Differentials in stock and
to order also. Baldwin, Dia-
mond and Whitney Chains.
Send for new Catalog.Cullman Wheel Co.
1027 Dunning St., Chicago**PARISH & BINGHAM**

PRESSED STEEL

**FRAMES
ARE STANDARD**

WRITE FOR ESTIMATES

CLEVELAND, - OHIO

"WHITNEY" CHAINS

KRUPP AUTOMOBILE CRANK SHAFTS, STEEL FORGINGS AND FRAME MEMBERS, GEAR BLANKS. KRUPP BAR STEEL BALL MILLS, TUBE MILLS AND OTHER MACHINERY

**Chrome Nickel Steel, Round Bars in Stock, having
Minimum Elastic Limit 95,000 lbs. per square inch.
This Steel can be Oil or Case Hardened so as to
have an Elastic Limit of over 200,000 lbs.***Use this "Toughest Stuff" and eliminate the Breakages you are now having.*

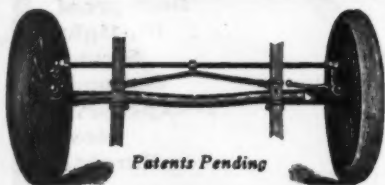
THOMAS PROSSER & SON, 28 Platt Street, New York

KRUPP STEEL LOCOMOTIVE TIRES AND CAR WHEEL TIRES, CRANK SHAFTS, STEEL FORGINGS AND CASTINGS, STEEL Tired CAR WHEELS, PROSSER BOILER TUBE EXPANDERS

WE MANUFACTURE FOR THE AUTOMOBILE TRADE

Complete Front and Rear Ball-Bearing Axles

THAT ARE WELL-KNOWN FOR DURABILITY AND EFFICIENCY

Call on or write us regard-
ing your requirements.**THE AMERICAN BALL-BEARING CO., CLEVELAND
OHIO, U. S. A.**

Patents Pending

"The Little Steersman" A Wonderful Safeguard to MotoringYou really can't appreciate the wonderful protection from accidents to both car and occupants that this
fitment gives, without writing to us for full particulars or testing it on your car. Seems incredible with-
out seeing it, but "The Little Steersman" automatically keeps your car under control at all times, and
greatly relieves the strain of steering. Accidents are absolutely impossible. Easily attached to any
auto. Once used you'd never be without it. **PRICE ONLY \$5.00. Your life and the safety of your car
are worth more than \$5.00, aren't they?** Of course—then equip your car NOW. Satisfaction guaranteed.Send your order TO-DAY or write for
full particulars**THE ABRAMS-MASON CO., Chatham, New York**

ALUMINUM

PHOSPHOR BRONZE and BRASS

CASTINGSFOR AUTOMOBILE WORK
PIONEER BRASS WKS., INDIANAPOLIS, IND.**HESS-BRIGHT****BALL BEARINGS**AMERICAN 2106 Fairmount Ave. EUROPEAN
PHILADELPHIA, PA.**Automobile Gears**Mechanically perfect
Prompt deliveries*If in a hurry, wire us*R. D. NUTTALL COMPANY
PITTSBURG, PA.Drop Forged
Pressed Steel
Hammer Forged
Machined and Ground
Parts of all descriptions

DRIGGS-SEABURY ORDNANCE CORPORATION

Blueprints requested Sharon, Penn'a.

Special Drop Forgings in Quantities
Chrome Nickel and all Special Steels
Oil Treating and AnnealingThe Canton Drop Forging and Mfg. Co.
CANTON, O., U.S.A.**DROP FORGINGS**Of every character, also Steam Hammer
Crank-Shaft Forgings—Rough Slotted,
Rough Turned, or Completely Finished.
SEND BLUE PRINTS FOR ESTIMATESANDERSON FORGE & MACHINE CO.
18 ST. AUBIN AVE., DETROIT, MICH.**FRAMES**HYDRAULIC PRESSED STEEL CO.
CLEVELAND, O.**PEUGEOT CHAINS**

"STRONGEST IN THE WORLD."

296 BROADWAY,
NEW YORK**MACHINE WORK**OTTO KONIGSLOW MFG. CO.
CLEVELANDGIVE IT A TRIAL
The Raymond Brake
(Simple—Strong—Sure)
ROYAL EQUIPMENT CO.
195 Newland Ave. Bridgeport, Conn.**The Ball Transmission**
FOR
Automobiles & Motor Boats

NEW YORK GEAR WORKS.

56 GREENPOINT AVE., BROOKLYN, N. Y.

**The
Gas Engine**

By Frederick Remsen Hutton, E.M., Ph.D.

An extensive treatise on internal combustion motors from a theoretical standpoint, though this book contains a great amount of practical information of especial value in studying the larger types of gas engines. The mathematics of internal combustion engines is thoroughly covered, including mathematical explanations of possible cycles of operation. This work forms a valuable addition to the library of the gas engine student, its many fine illustrations and line engravings, together with a particularly complete index, making it of especial interest.

Size, 6 inches by 9 1-4 inches. 474 pages
PRICE, Cloth Bound, Prepaid, - - \$5.00

**THE
AUTOMOBILE**

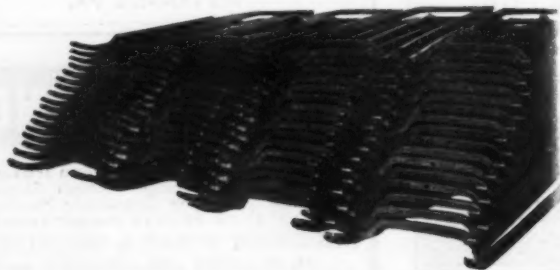
231-241 West 39th Street, New York

Induction Coils

Give easily understood explanations of the operation of coils. Of great value to the autoist. By H. S. NORRIE, 265 pages. Numerous illustrations Cloth bound. Price, \$1.00. Address The Automobile, 231-241 West 39th Street, New York.



**Capacity for 100,000
Pressed Steel Frames
per Annum**



**AUTOMOBILE FRAMES
FRONT and REAR AXLES
TRANSMISSIONS
MULTIPLE DISC CLUTCHES
STEERING COLUMNS
and Heavy and Difficult Stampings**

SEE OUR EXHIBITS:

Grand Central Palace	- - - -	Space 134
Madison Square Garden	- - - -	Space 205
Coliseum, Chicago	- - - -	Space 6

A. O. SMITH COMPANY
247 Clinton Street, MILWAUKEE, WIS.

Let Us Make Your
**HUB CAPS,
SIDE LEVERS,
and
LAMP BRACKET
CASTINGS**

from
**Manganese Bronze
or Yellow Brass**

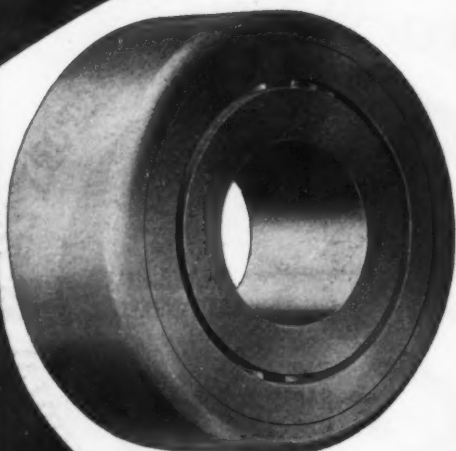
They Will Be Smooth and Accurate to
Pattern.

**SYRACUSE ALUMINUM & BRONZE CO.,
SYRACUSE, NEW YORK**

THOS. J. WETZEL, Eastern Sales Agent, 29 W. 42nd St., New York City

TWO-IN-ONE

**NEW DEPARTURE
TWO-IN-ONE
BALL BEARING**



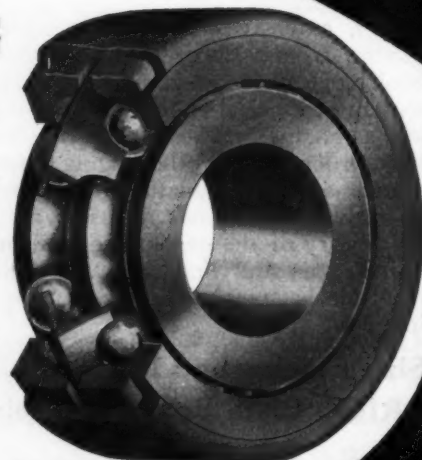
The only bearing that is **equally
strong in all directions.**

The only bearing that will take thrust
from any direction, or radial load
or combination thrust and radial
load.

**Positively Economizes Space,
Weight, Labor, Material, Cost.**

FULLY GUARANTEED

All inquiries fully answered. Write



**The New Departure Manufacturing Co.
BRISTOL, CONN.**

We will exhibit at Grand Central Palace Show, New York, Space 407, Section J,
third floor; also at Madison Square Garden Show.

NOW is the time to equip your car with the Burnet Compound Inner Leaf Springs.

Do not wait until the Spring time, but get the car in readiness for the rough roads, mud and slush that are to come.

If a shock absorber is necessary on a Spring, it is an admission that the Spring itself is defective.

REMEMBER no shock absorbers are needed for the Burnet Compound Springs. They, themselves, absorb the shocks and jolts, without impairing the proper flexibility of the Springs.

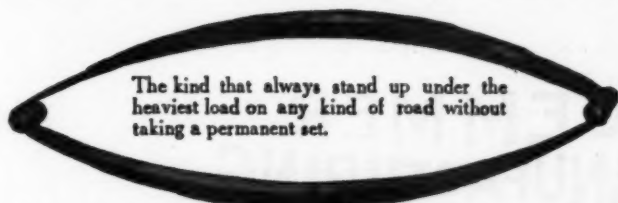
Be sure and call upon us at the Shows, and see how Springs work. Grand Central Palace, Second Balcony, space 331. Madison Square Garden, Balcony 241.

BURNET COMPOUND SPRING

738 BROAD STREET

NEWARK, N. J.

SPRINGS FOR BUSINESS FOR PLEASURE



The kind that always stand up under the heaviest load on any kind of road without taking a permanent set.

Require a full knowledge of spring materials and methods of making. We add to these a guarantee. Our experience is yours for the asking.

The CLEVELAND CANTON SPRING CO.
CANTON, OHIO, U. S. A.

JOT IT DOWN

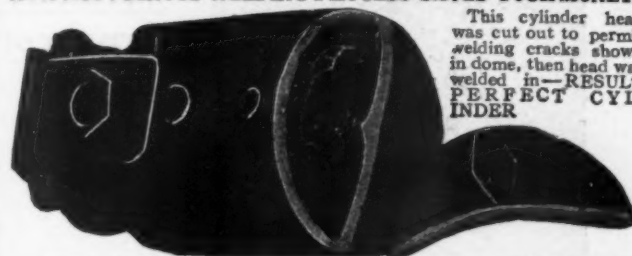
to call at our exhibit at either of the New York Automobile Shows.

You will find an interesting display of our product, including several new and distinctive features.

SPACE 155, A.M.C.M.A. SHOW

Standard Roller Bearing Co.,
PHILADELPHIA, PENNSYLVANIA

NEW AUTOGENOUS WELDING PROCESS SAVES YOUR MONEY.



This cylinder head was cut out to permit welding cracks shown in dome, then head was welded in—RESULT PERFECT CYLINDER

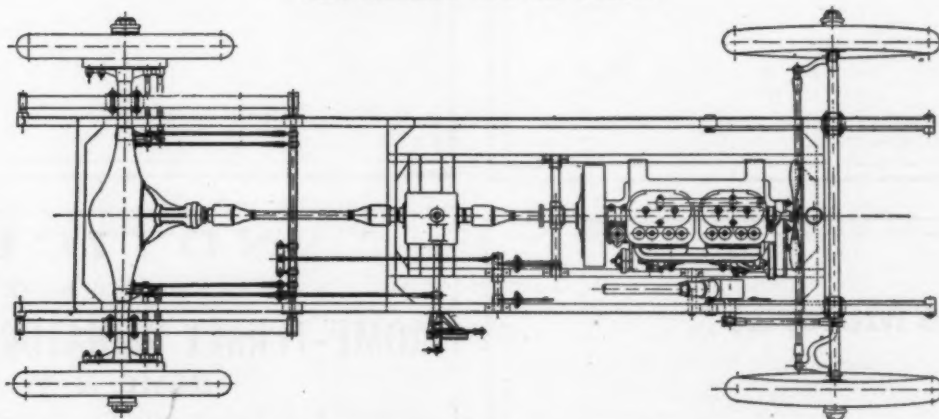
Your BROKEN CYLINDERS, WATER JACKETS, CRANK CASES, GEAR CASES, and ALL OTHER automobile PARTS in cast iron, aluminum or steel, we can WELD and GUARANTEE SATISFACTION, or no pay. We give PROMPT service and save you 100% or more. WE PAY FREIGHT on cylinders and cases east of Omaha. Address Dep't B. Do not confuse this process with brazing.

NATIONAL WELDING & MANUFACTURING COMPANY
1422-1430 Niagara St., Buffalo, N. Y.

To Carriage and other Manufacturers:

LET US FURNISH THE CHASSIS, YOU THE CAR

Chassis for Touring Cars, Tourabouts and Runabouts, or Cars ready to paint and trim; also finished Cars to order.



Automobile Parts

We can supply anything and everything entering the construction of a high class automobile. Detail information upon application.

The McCue Company, Hartford, Conn.

MR. MANUFACTURER

Don't spoil an otherwise good car with a cheap unreliable steering gear.



The Gemmer Gear is the only one made that has a guarantee worth anything back of it.

It won't put a car in the ditch or make the driver work like a day laborer to keep in the road or turn a corner.

WRITE US FOR BLUE PRINTS

**GEMMER
MANUFACTURING
COMPANY**

Stanton and Merrick Aves.

DETROIT, MICH.

The Automobile Handbook

By L. ELLIOT BROOKES

This work was written to supply practical information to automobile owners and operators with additional information of value to the automobile mechanic. Gives concise information about questions relating to the construction, care, and operation of gasoline and electric cars, and contains further, mathematical formulas, tables and rules. Road troubles, motor and transmission difficulties and other possible contingencies are carefully treated. Subjects are arranged alphabetically facilitating quick reference.

320 pages; over 100 illustrations. Size, 4 1-2 inches by 6 3-4 inches. Popular edition, full leather, limp, \$1.50.

Address: THE AUTOMOBILE,
231-241 W. 39th St., New York.

The Motor Pocketbook

By MERVYN O'GORMAN, M.I.E.E., A.M.I.M.E.

A complete book of useful information about the automobile, covering the entire field in an interesting way. The contents of this volume are arranged in encyclopedia style, each word being followed by its French and German equivalent and the ease with which any subject may be turned to is a strong feature. The Motor Pocket Book comprises 387 pages and 144 carefully selected illustrations.

It is convenient in size, 4 1-2 inches by 6 1-2 inches and well bound in leather. Postage prepaid, \$3.00.

Address: THE AUTOMOBILE,
231-241 W. 39th St., New York.

The Complete Motorist

By A. B. FILSON YOUNG

All about the automobile; how to select and run it; its mechanism and history. The absence of theory without sacrificing practical value makes this volume of special interest to the autolst who, though not mechanically inclined, wishes to know all about the subject treated. Written in a style entirely different from the average treatise about automobiles, yet complete and entertaining, so that to read it is a pleasure rather than a task. The matter is interspersed with comments that liven it up wonderfully while in no way detracting from the technical value of the work.

Size, 6 inches by 9 inches, 328 pages. Nicely bound in cloth, delivered free, \$3.50.

Address: THE AUTOMOBILE,
231-241 W. 39th St., New York.

NOTICE.

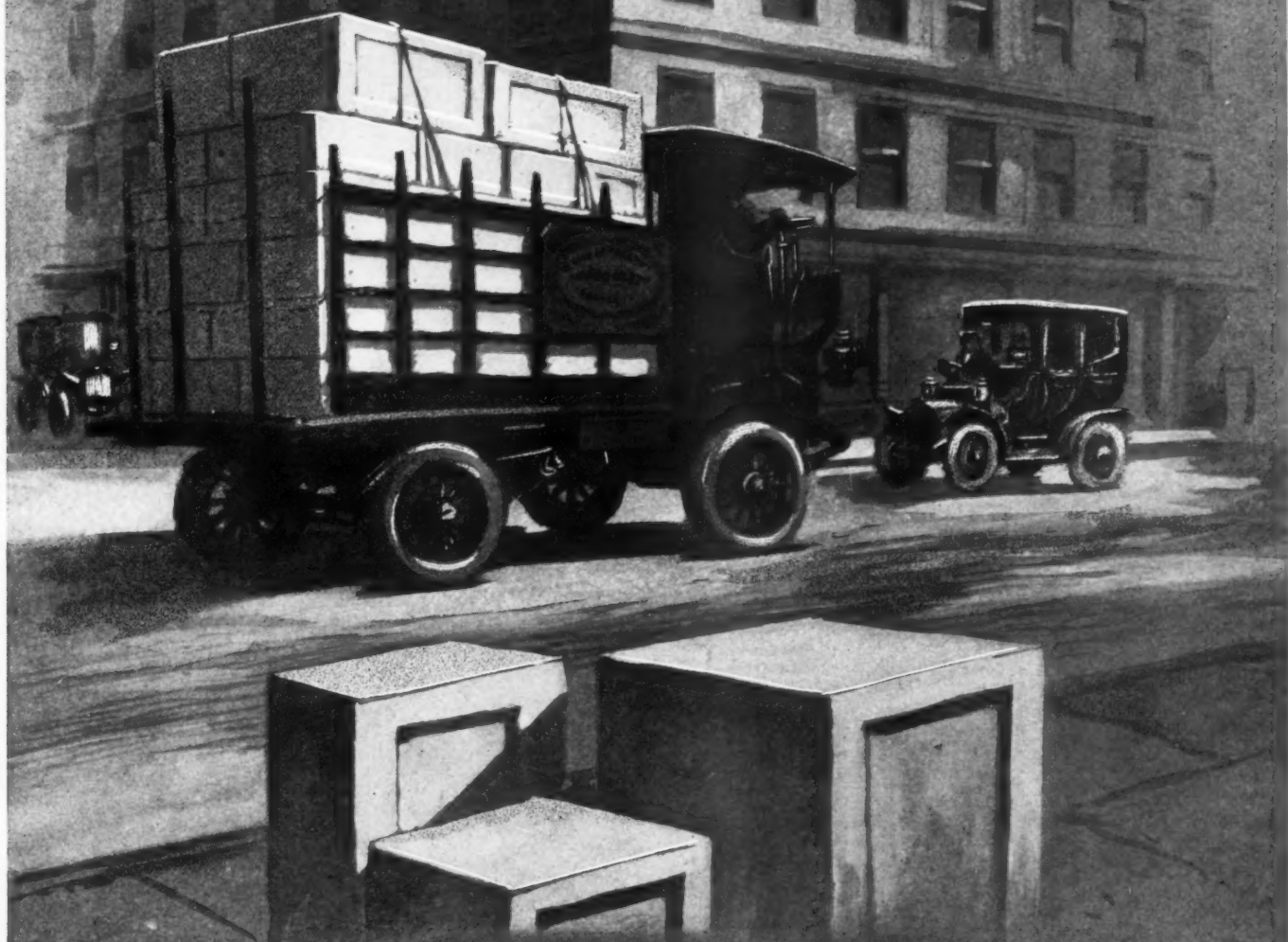
CHANGE OF NAME

ROME-TURNEY RADIATOR COMPANY, ROME, N. Y.

Formerly Long-Turney Mfg. Co., Manufacturers of Home Spiral Tube Radiators and Condensers. We wish the trade to know that we have made extensive additions to our plant and with the added equipment, our facilities are ample to take care of the RUSH orders and contracts that buyers may be ready to place. Let us hear from you. Send us blue prints and allow us to estimate cost for your requirements.

**ROME-TURNEY RADIATOR COMPANY,
ROME, N. Y.**

Commercial Car Section



INCLUDING

Taxicabs, Delivery Wagons, Trucks, Tractors, etc.



Model A-3, \$1200

A Unit Power Plant

Interchangeable, self-contained,
places this vehicle in a
class by itself

Capacity 1000 pounds

Made by Specialists

SIMPLE — RELIABLE — EFFICIENT

HART-KRAFT

Commercial Power Wagons

A REVOLUTION IN COMMERCIAL CAR CONSTRUCTION

Delivery Wagons that DELIVER QUICKLY
ECONOMICALLY and SURELY

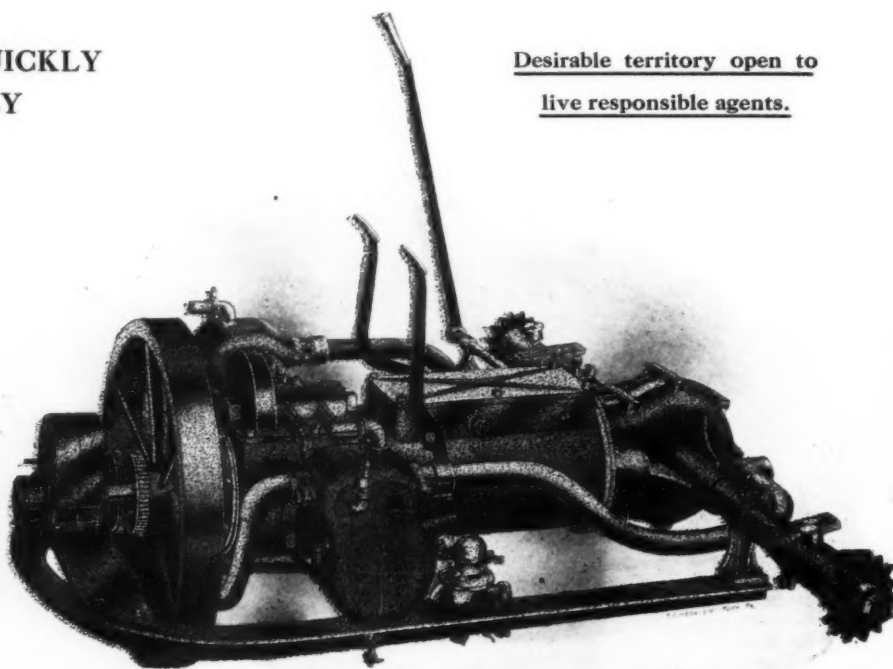
Manufacturers

**Hart-Kraft
Motor Co.**

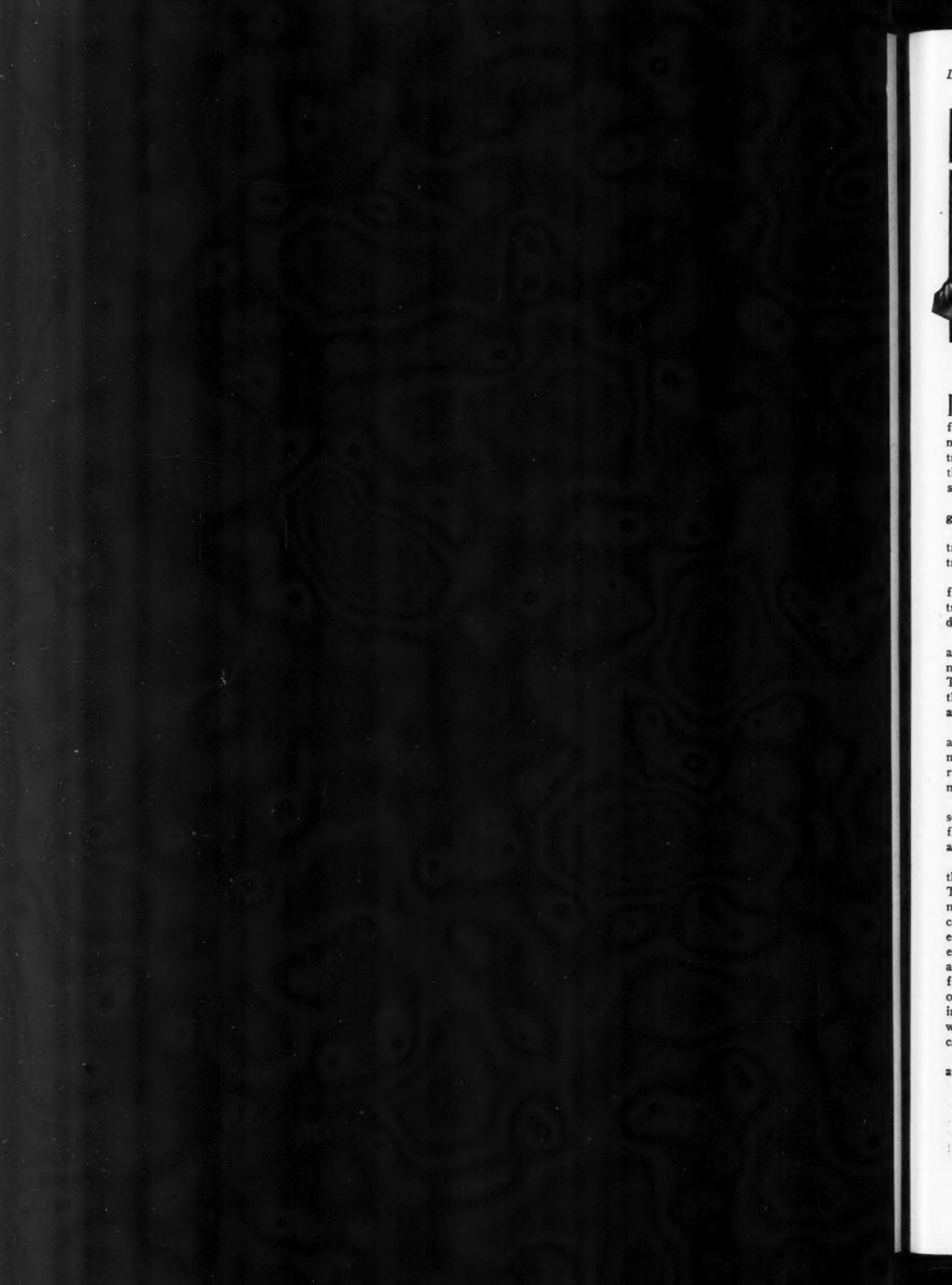
YORK, PA.

New York Distributors:
POST MOTOR CO.
1623 Broadway

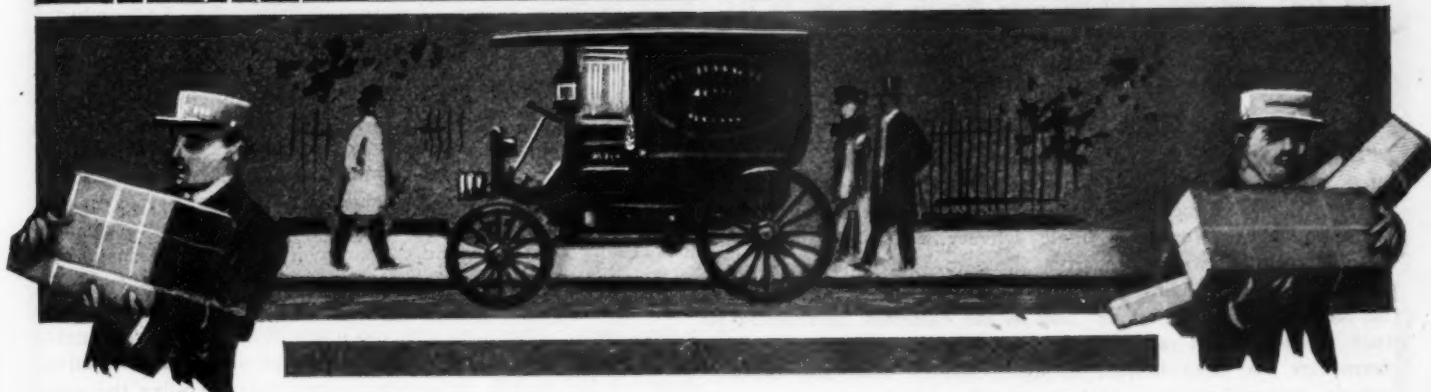
Desirable territory open to
live responsible agents.



Unit Power Plant



The Automobile in Commercial Work



PLEASURE, then profit, seems to be the logic of the autoist.

At all events, the pleasure types of automobiles were perfected first, and the commercial types were the product of necessity. The automobile as a mode of motion and a means of transportation can no longer be denied its place at the head of the line, nor will it be subdued in its onward march until it stands in the light of "lock, stock, and barrel."

Of the commercial automobiles, there are steam, electric, and gasoline, named in the order of their coming.

Steam is widely the underlying principle in tractors and heavy trucks, with a growing tendency in the direction of the lighter trucks and delivery wagons.

The electrical automobile long dominated a certain zone, which, for brevity, can be set down as the "short haul" of the electrical commercial, they range from heavy trucks down to light delivery wagons.

The gasoline commercial was slow in coming, but from appearances it will persist in staying. The gasoline automobile may now be seen in divers forms as trucks, tractors, and deliveries. There seems to be no limit as to capacity, nor is the nature of the merchandise to be transported, of necessity, taken into account.

The trend is away from the old practice of trying to impress a touring car chassis into commercial work, and account is now taken of the conditions that surround the work to be done rather than to placate the forces of the shop in which the automobile may be constructed.

It would be very nice, were it possible, to make one chassis serve in all zones of activity. It is very discouraging to try and fail. In all cases thus far, failure (certainly not success) has attended the effort.

This fact probably had more to do with the retarded use of the commercial automobile than any other dozen of conditions. The labor problem and the personal equation generally is even now a retarding factor; much improved, however, partially because the automobile has been simplified, and, again, due to the education of men generally in the ways of the automobile. The especially devised commercial automobiles of the present time are so perfectly simple and devoid of delicate parts as to assure freedom from harassing and costly interruptions, if only the operators will confine their attentions to the simple process involved in running the cars. The screw driver, the monkey wrench, and the squirt-can may be left in the garage, and the cars will serve well their respective purposes.

The commercial automobile situation, as it may be regarded at the present time, includes the divisions as follows:

- (1) taxicabs;
- (2) heavy trucking;
- (3) suburban express;
- (4) general delivery work;
- (5) utility-pleasure automobiles.

In addition to the sub-divisions above set forth, there are

divers uses to which the automobile may be put to that will not be elaborated upon here, since the cars do not have to be especially devised for the purposes. In other words, within certain limits, a given model can be used for several commercial purposes, and serve well.

Characteristics of Taxicabs.

In a general way, taxicabs differ but slightly from town cars. The town car in private service is maintained on a little higher plane as respects appearance than the taxicab in public service. The underlying mechanical features would be common in the two types of cars. The body work would be a little more stylish and a little less stable in the town car proposition, whereas the taxicab service body should be of neat design, but of great stability. The taxicabs promising most at the present time are of moderate power, short radius of turning action, and easy on tires, which is brought about by way of the elimination of unnecessary weight and good spring action.

Taxicabs are especially economical in the use of gasoline, and, with the customary supply of this fuel, they have a wide radius of action. The cost of maintenance on the whole is extremely low, and the operator is not expected to be able to make any repairs at all. It is but rarely that taxicabs become disabled in the street (accidents accepted), and it is better, in view of this fact, to do without the class of labor that would turn every side street into a repair shop. There is nothing that would retard the patronage of taxicabs so much as the spectacle in its disagreeable aspect represented by a man of no great skill tinkering with a taxicab that refuses to run.

Growing Field of Heavy Trucking.

"The seventeen mule team" hitched to a "prairie schooner" is the best illustration of the stupidity of man that can be found in any land. It is slowly percolating through the centers of intelligence of those who require goods to be transported that the automobile truck is here, and is available for use for every purpose of goods transportation without any limit whatsoever and on a basis of decreased cost per ton mile of the goods transported. If the automobile truck has appeared to be backward in connection with the work in question, it has been through lack of appreciation on the part of merchants rather than lack of ability of the trucks. These outside retarding influences were unfortunate, in that they made it impossible to acquire a full measure of experience, and on this account improvements seen to-day at every hand may be regarded as tardy.

In this zone of activity honors are pretty evenly divided, although in the past the extremely heavy work was done by the "steam lorry," while the average commercial undertakings were partial to electrical trucks. Gasoline trucks did not come into vogue to any great extent until very recently, mostly because the builders of gasoline cars had about all they could handle in pleasure work. A few of the companies handled the commercial situation as a side line, merely converting their

chassis into light trucks, and delivery wagons. This was more a misfortune than anything else, due to the great difference as between pleasure cars and cars required in the transportation of commercial lines. The gear ratio in such cases would scarcely lend itself, and many failures were directly traceable to the use of sprocket wheels with as few as eight teeth. A given motor cannot drive a car as fast as possible and haul a load as big as possible at the same time.

The High Speed Transportation of Goods.

If the heavy trucks are confined to a certain class of work at a slow speed, the modern delivery automobiles make up for any loss of time in connection with suburban express and general delivery work. A single delivery wagon, as they are designed to-day, will make from three to four trips per day, as against one trip with a span of horses. The automobile will do this work "rain or shine" and in the extremes of temperature. These special cars are provided with a commodious platform, are no more limited in load capacity than any other vehicle, and will make as high as 20 miles per hour, as against a quarter of this speed with horses. The same men who formerly handled the horse-drawn delivery wagons can be, and are, used, in automobile service. The labor item is reduced to about one-fifth of that in connection with horse-drawn vehicles, while the advantage of quick deliveries by way of satisfied customers is difficult to estimate, and is rarely ever adequately taken into account.

There are advocates of the automobile delivery wagon who are firm believers in the future of the automobile to the extent that it will displace every other means of transportation in local hauls. Any one who will take the trouble to trace the ramifications through which a small package will have to go in transit from a store in a city to a purchaser in a suburb, not 20 miles away, will quickly reach the conclusion that a single handling and a direct automobile transport is inherently economical. It is the inherent economy that will obtain in the long run, retarded only for a time because of the compactness of commercial organizations so busy conducting a complicated system that they have no time to recognize the merits of a direct method.

Utility-Pleasure Automobiles.

Merchants in a small way are fast becoming used to the idea of displacing the single (horse) delivery wagons in favor of automobiles, so designed as to serve in delivery work during the week, to be converted into pleasure autos on Sundays and holidays. This very large field is being exploited by small cars of considerable merit. The cost of this service, under suitable conditions, compares favorably with the cost in the old way. Runabout types of automobile with suitable body modifications serve well the purpose, especially in the cases in which tires are afforded a reasonable measure of intelligent attention.

High Wheel Types of Delivery Wagons.—In this connection it may be well to mention the advances now being made in high wheel cars in which it appears, some of them at any rate, are finding their way into commercial work, especially for use in the grocery trade and in the service of small merchants generally. This class of cars are of low cost, simple to operate, and they can be converted into pleasure vehicles at will, at a moment's notice. In the towns and villages throughout the land the roads are not so good as to be easily negotiated by cars with a low clearance, especially in the winter time, if there is much snow on the ground. The buggy type seems to serve well the purpose under such conditions, which is a guarantee in itself that the same type is not limited, since if it will do under adverse conditions there is nothing to prevent its working under favorable circumstances. In whatever service the type will serve, it is bound to impress itself, primarily because the first cost is low and in view of the ease with which it can be converted. The simplicity of the type is an assurance that the users will be able to master the same even though skill may be at a low level from the mechanical point of view.

On the whole, the experimental side of the commercial situation passed off smoothly, and the absolute failures were few and far between. They consisted, for the most part, in ventures of a most shady sort, ventures in fact that could only end in losses, as almost anyone of reasonable knowledge of the industry might have predicted. Inventing to fill a long-felt want, which is a practice not uncommon, is always attended with dangers, and it was mostly along such lines that the industry stubbed its toe, so to speak. As the automobile accumulated stability, which was a matter of going slow enough to imbibe of experience, the commercial situation expanded, and to-day there is no chance of failure, nor can it be said that much less than signal success will attend efforts to utilize commercial automobiles in every single instance in which merchants have goods enough to transport to an extent that would keep a hand-cart overburdened.

The old idea of using the automobile as an advertisement is a dead issue. There are now too many of them in use to enable any user to "stand out" as more enterprising than a hundred dozen of his equally prosperous competitors. To-day the commercial automobile is used because it will do more work, and more prompt work, than can be done in any other way. By more prompt work, it is to say, the given quantity of merchandise can be moved in less time. A canal boat will serve to transport goods by wholesale, only time is taken in the process. A railroad will transport the same bulk in far less time. It only pays to use the canal if time is no object. In a big store time is money, because the rent and the other charges are enormous, and they go on, measured only by the tick of the clock. With a canal boat, if the goods are not in immediate need, they are purchased on a low market, and the time taken in their transportation is an advantage, since storage charges will not have to be paid in the meantime. The low freight rate, coupled with the "free storage," renders canal methods especially desirable, which, however, represents a mode of procedure that is foreign to the merchant, whose customers want the goods they order the day they are ordered.

Comparison of Transportation Cost, Auto vs. Horse.

There has been a good deal of discussion in relation to the question of the relative cost of goods transportation, considering animal-drawn vehicles on the one hand and automobiles on the other. Much of the discussion was without good foundation in that the comparisons were not fairly presented. A biased advocate is bound to disregard the side he does not intend to represent, and he is prone to misrepresent the side he espouses. Such presentations are damaging to both sides of a case, and reliance must be placed on the good judgment of those who are the unwilling audience in such instances. In any event, the proof of the pudding is in the eating, as they say, and the merchants who sampled the commercial automobile must have liked the flavor, since the industry has grown and prospered.

Notwithstanding this growth, there is still much opposition to overcome, due in no small measure to the presence of "horsemen" in charge of the transportation of goods for merchants. They know all about horses; they like animals; their knowledge of the automobile would be great if they knew as much about them as they do about "spavins." This loyalty to the horse is commendable in the extreme. Loyalty is a virtue. When it fades away, or when merchants put automobiles in the hands of the men who will appreciate their needs and the conditions under which they will render the best service, then, and then only, will the records of costs be worth taking into account.

It will occasion no great alarm, even if these conditions do obtain to quite some extent, for two reasons at least. In the first place, if merchants really knew how thoroughly good automobiles are for the purpose of transporting goods they would not use horses at all, and the change would come so suddenly as to discommode the breeders of horses, and the wagon builders, whose investment would be destroyed. In the second place, the requisite number of skilled men in the automobile industry would be difficult, if not impossible, to provide.



**The Largest Contributor to the
Success of Commercial
Motor Vehicles**

Diamond

Wire Mesh Base Tires

Results

Exclusively for this work. Whether measured by ton mileage, aggregate economy, or length of time in service, they all spell Economy. No machinery needed to apply.



Diamond

Side Wire Solid Tires

Made Diamond Way Throughout

The side wire feature refers to style and application only. *Diamond rubber and Diamond know-how deliver the mileage.*

The Diamond Rubber Co.
Akron, O.

The Rapid Agency Proposition



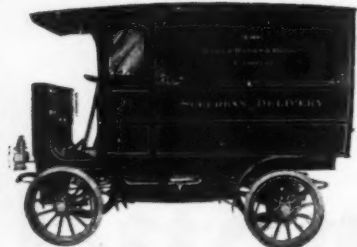
12-Passenger Pullman

For the profitable business of sight-seeing hotel work, summer and winter resort work, etc.



1-Ton Open Job

For all kinds of carting purposes.



1-Ton Panel Job

Suitable for dry goods and general delivery work.



The 5-Ton Truck

Built in 3, 4, 5 and 6 ton sizes suitable for



flour mills, breweries, lumber companies, coal companies and any line of business requiring a heavy-duty power wagon.

HERE is a proposition for the one best man in every city—for the broad-gauge business man or agent—a proposition full of opportunities—one which means more money for the agent during 1909 than ever in the past; namely, *representing and selling*

Rapid Commercial Power Wagons

We want agents—hustling business getters—men with financial backing—not chauffeurs or demonstrators—and to the one in each locality who secures the agency for **Rapid Commercial Power Wagons**, we will put behind him one of the greatest selling and advertising campaigns ever put behind any commercial power wagon proposition.

More money, more new plans, more legitimate aids will be given the agent for **Rapid Commercial Power Wagons** than ever before.

Write to-day for our agency proposition.

The Rapid Line for 1909

comprises models ranging from 1,000 pounds up to 6 tons, as follows: **Rapid Commercial Power Wagons** for any line of business in $\frac{1}{2}$, 1, 1½, 2, 3, 4, 5 and 6-ton sizes.

Motive power: engines of the two-cylinder opposed 24 to 30-H.-P. type, up to four cylinders, 60-H.-P., vertical, heavy duty motors.

The **Rapid** line for 1909 offers the largest selection of models ever manufactured.

Therefore every user of one or more horses represents a prospective buyer of **Rapid Commercial Power Wagons**.

There are no theories represented in the Nineteen Hundred Nine **Rapid Commercial Power Wagons**. All mechanical and other details have been proved correct by over ten years of actual service in the hands of hundreds of users in over fifty different lines of business.

We have spent over a quarter-million dollars to bring **Rapid Commercial Power Wagons** up to their present state of perfection and efficiency.

The agent who handles **Rapid Commercial Power Wagons** will have a line that can back him up—a line that has "made good"—one that has met the requirements of commercial motor wagon practice, and needs no apologies.

A word about the **Rapid Motor Vehicle Company**: It is the largest and oldest in the commercial car business—and makes nothing but **Rapid Commercial Power Wagons**, which are "**BUILT FOR BUSINESS.**"

The agent who "ties up" to our organization gets backing which means a great deal, not only in influence, but in protection and fair treatment; a factory which can stand back of its product with a guarantee that means just what it says and a factory which helps its agents in every way possible.

Just to remind you—write to-day.

See us at the New York, Boston and Chicago Shows.

Rapid Motor Vehicle Company

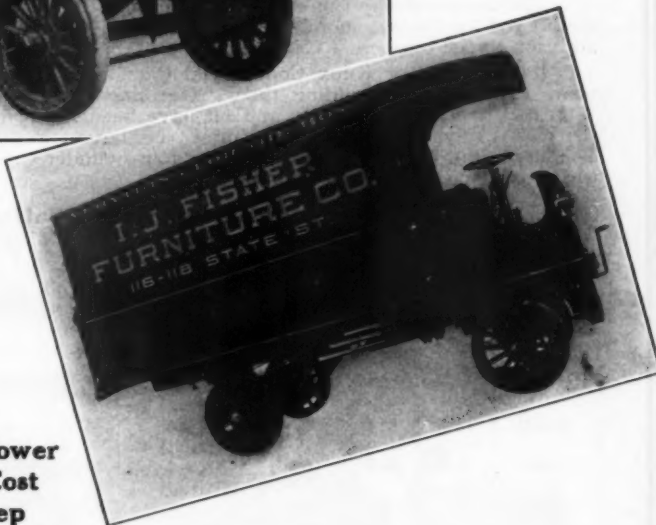
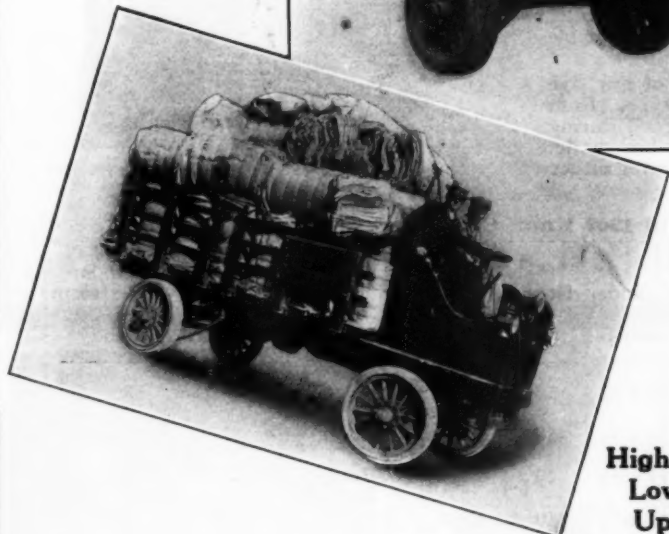
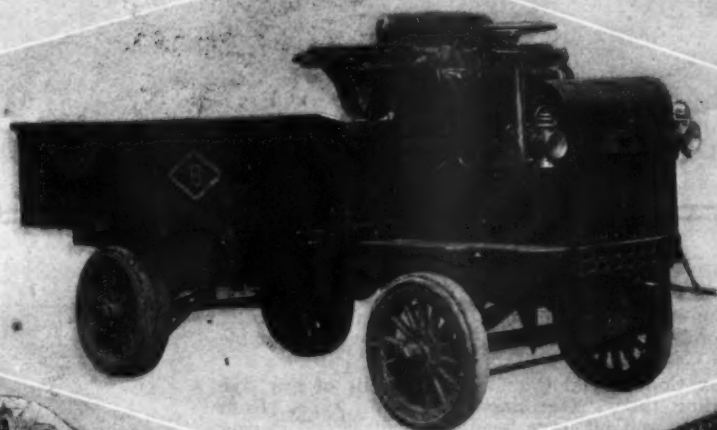
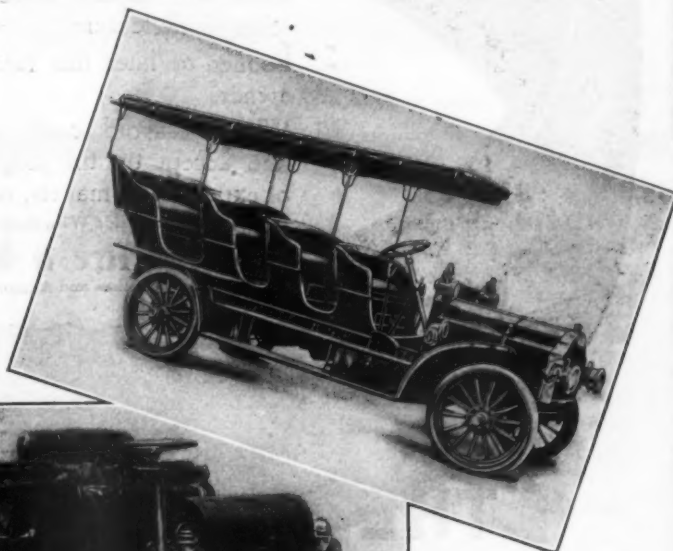
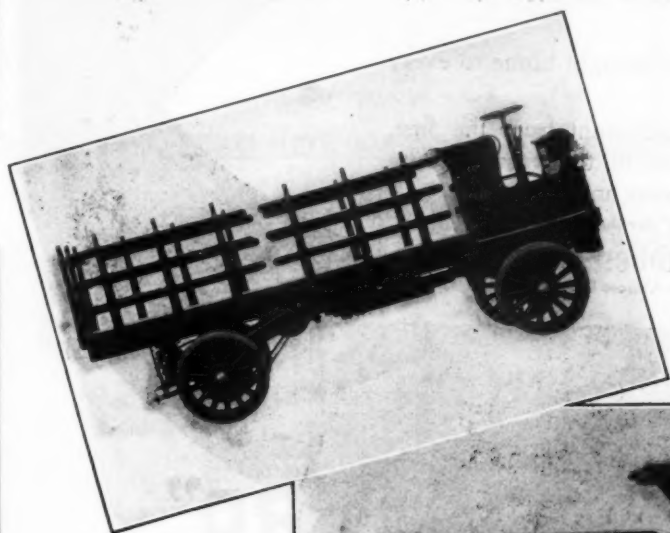
510 Rapid Street, Pontiac, Michigan, U. S. A.

Members American Motor Car Manufacturers' Association.

"AMERICAN TRUCKS"

Are Really Good Trucks—One to Five tons Capacity

4-CYLINDER, 4 CYCLE ENGINES



High Power
Low Cost
Upkeep

See them at Grand Central Palace Show

For Catalogs and Service Records, address request to

American Motor Truck Company, MAIN OFFICE and **Lockport, N. Y.**
FACTORY,

MANUFACTURERS OF

COMMERCIAL AUTOMOBILES EXCLUSIVELY

Branches: **NEW YORK CHICAGO SAN FRANCISCO**

Firestone WIRE TIRES

THE SUCCESS OF YOUR commercial motor vehicle or its failure as an economical distributing agent will depend more upon its tires than any other single feature.

Sooner or later this fact is brought home to every owner.

Why not avoid costly experiment from the first, and accept the tire judgment of the vast majority of experienced makers, owners and users?

"Side Wire Booklet" for the asking

Firestone Tire & Rubber Co., Akron, O.
Branches and Agencies Almost Everywhere

"THE WORLD'S STANDARD"

KNOX 1909 COMMERCIAL CARS

The future of the Commercial Car is one that should be carefully considered by the automobile dealer, and can be made a very valuable addition to the business.

1909 Models of Knox Commercial Cars are the result of our five years' experience in building them. Our line includes all types, from 1500 lbs. to 5 tons capacity, and all have been newly designed during the past 15 months and now comprise the largest and best line made. The larger and heavier trucks are of the four-cylinder type, having either water or air cooled motors.



Model 18, 5-ton truck.

Types and Brief Specifications of 1909 Knox Commercial Cars

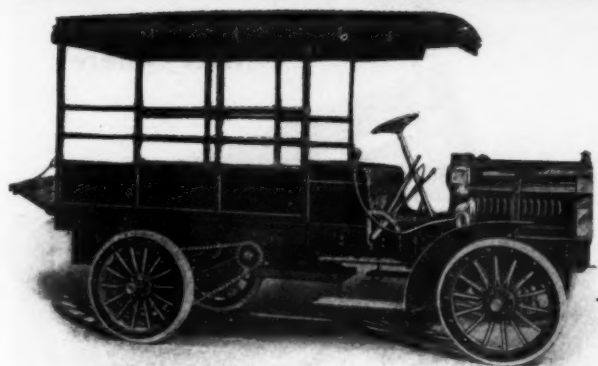
Capacity lbs.	Speed miles per hour	Wheel base Ins.	Tread Ins.	Tires Ins.	Motor Type	No. Cyl.	Cylinder Dimensions	Horse Power	Weight Chassis lbs.	Price of Chassis	Size of body Standard Platform	Price of Standard Platform or Express Body
10,000	12	154	67	36 x 5	M-1	4	5½ x 5½	50	5,600	\$4,300.00	14' 6" x 72"	\$350.00
8,000	12	154	67	36 x dual 4	M-2	4	5½ x 5½	50	5,400	4,000.00	14' x 72"	300.00
6,000	15	149	67	36 x dual 4	G-15	4	4¼ x 5½	40	5,100	3,750.00	12' x 72"	250.00
4,000	15	125	60½	36 x dual 3½	G-14	4	4¼ x 5½	40	4,200	3,500.00	10' x 56"	250.00
3,000	15	100	56	34 x 4	D-6	2	5 x 7	20	3,260	2,600.00	9' 3" x 56"	200.00
2,500	20	97	56	34 x 5	D-7	2	5 x 7	20	2,100	2,200.00	9' 8" x 44"	200.00
1,500	15	85	56	34 x 3½	E-20	1	5 x 8	12	1,800	1,400.00	7' 3" x 44"	200.00
				32 x 3½								
				32 x 3								
				36 x 3								

Send for Catalogue "C."

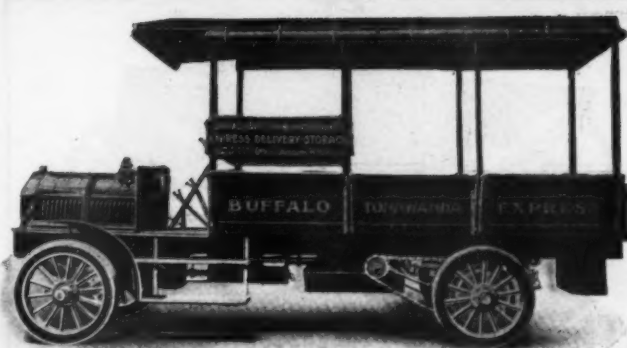
We exhibit at both the New York Madison Square Garden and Chicago Shows.

Member A.L.A.M.

KNOX AUTOMOBILE COMPANY, Springfield, Mass.



One-ton, Four-cylinder, 25-h.p. Truck.



Three-ton, Four-cylinder, 40-h.p. Truck.

We Are the Oldest Makers of Commercial Cars in the United States

We have been pioneers in all improvements and design. We have had the experience that must be had in order to build successful commercial cars. The many little kinks in the design and construction of our cars are results of practical operation, a development that overcomes all faults in commercial cars. Our cars have proven themselves; they have been in service for years and have always proved satisfactory.

Now isn't it better to come to us who know and have the **proven goods**, than 'tis to mix up in experiments, that may or may not be right?

We show a few types of our cars here. You will note that there is an element of fine finished design to all of them. While being strong and sturdy, they also carry a pleasing appearance.

In the matter of sight-seeing cars we have built more than any other manufacturers, simply because each last car has been a clean, satisfactory car in efficiency and operation.

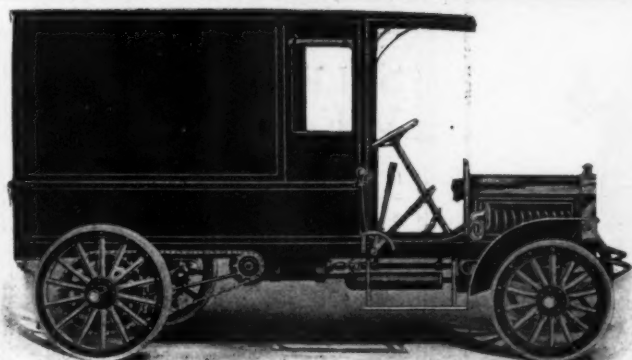
We are making a six-cylinder truck that is pronounced by disinterested people as the finest thing of the kind in the world.

Our hotel Omnibuses have gained especial distinction because of their freedom from repair costs, and their reliable operation under any and all conditions.

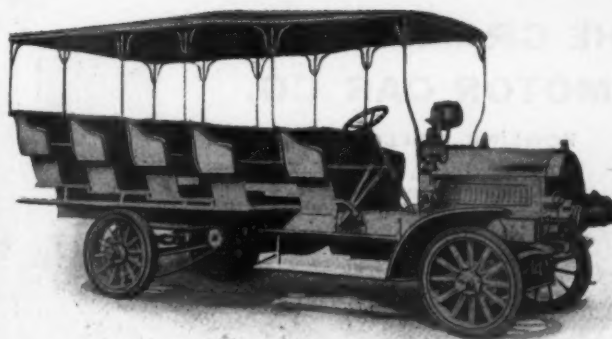
We have executed the largest orders for commercial cars in the United States; orders where price was of secondary importance to quality. We have the facilities, we have the men, we have the disposition to make these cars better than any one else, and we are disposed to sell them at a reasonable price.

We shall be pleased to have your inquiries and correspondence. They shall have prompt attention.

THE AUTO-CAR EQUIPMENT CO., BUFFALO, N. Y.



1,000-lb, Four-cylinder, 20-h.p. Delivery Car.



24-passenger, Four-cylinder, 40-h.p. Sight-seeing Car.



The Chase Motor Wagon

does the work of two horses at less than the cost of keeping one.

Simplest and Most Practical Engine in the World

two-cycle, air cooled. Not a delivery body with a touring car power plant, but built for business purposes only in a plant that makes nothing but business wagons.

Runs Twelve Miles An Hour—No Faster

You can't speed the Chase Motor Wagon, but it will run twelve miles an hour just as long as there is gasoline in the tank.

10 H.P. \$750.00. 15 H.P. \$900.00

Full particulars cheerfully given on request.

CHASE MOTOR TRUCK COMPANY

336 South West St.

Syracuse, N. Y.

"It Hangs Everywhere"

THE AUTOMOBILE TRADE DIRECTORY
231-241 West 39th St., New York

Are you using it as an advertising medium? If not, you are losing one of your best opportunities for effective publicity. Write for particulars.

Next Issue now in preparation

Write for Advertising Rates

THE GRAMM-LOGAN TRIO

Model X, 3 Tons, \$3500

Model V, 1½ Tons, \$2250

Model Y, 1500 Lbs., \$1600

These are commercial motor cars understandingly built, built with a full knowledge of what such cars should be in design and construction and what they should accomplish. Built to stand up under heavy loads and severe service and to be forever reliable and efficient. The use of these motor trucks means a faster and better profit to the user inasmuch as stuff can have faster transportation and in larger quantities per load. They take up less street room and less storage room, than horses and horse-drawn trucks and and there is a much less call for constant attention. A good motor truck is worth several horse-drawn trucks and a GRAMM-LOGAN Motor Truck is better than all other motor trucks. Convincing proofs to this end await your requests.

THE GRAMM-LOGAN MOTOR CAR CO.

BOWLING GREEN, OHIO



THE GAS ENGINE HANDBOOK

By E. W. ROBERTS, M.E.

A VERY useful manual of information about American practice in the construction and operation of stationary gas engines, for the use of the designer and engineer. Very little space is wasted on past history, for the book is of use for to-day. It contains many useful tables and formulas and a number of helpful drawings illustrate the text. Size, 3½ by 5½. Pages, 264.

Flexible Covers One Dollar Fifty

The CLASS JOURNAL COMPANY
231-241 W. 39th Street, New York

SELF-PROPELLED VEHICLES

By J. E. HOMANS, A.M.

IT'S a new book and tells the whole story. It explains in simple, non-technical language the mechanism and management of every type of automobile. 640 pages; 500 illustrations; complete diagrams; ready reference index.

PRICE, TWO DOLLARS

ADDRESS BOOK DEPARTMENT
The CLASS JOURNAL COMPANY
231-241 West 39th Street, New York


Buggy-Type Section



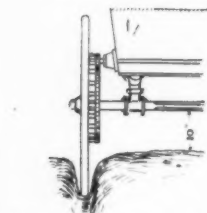
INCLUDING
The Several Examples of High Wheel Automobiles.



HOLSMAN AUTOMOBILES

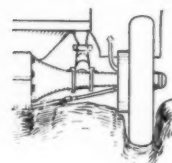


THE SWELLEST HIGH WHEEL AUTOMOBILE MADE

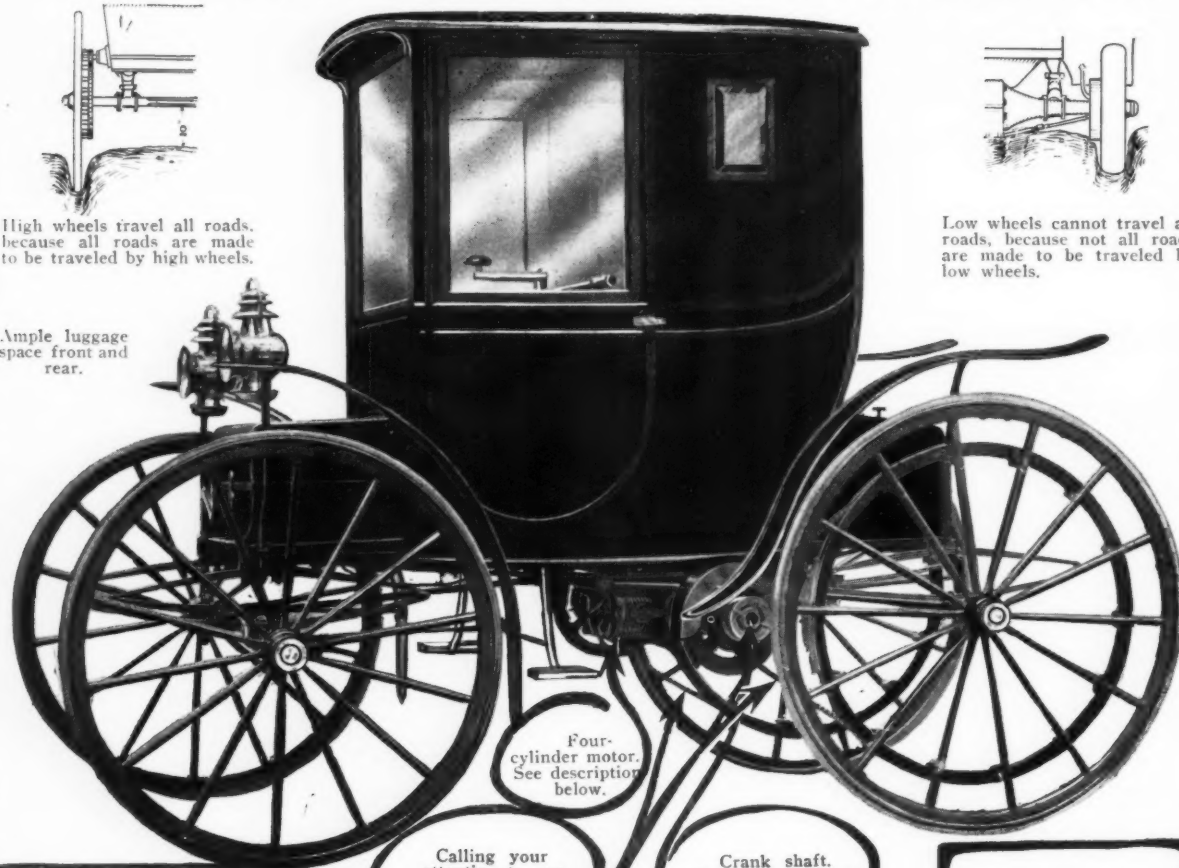


High wheels travel all roads, because all roads are made to be traveled by high wheels.

Ample luggage space front and rear.



Low wheels cannot travel all roads, because not all roads are made to be traveled by low wheels.



Four-cylinder motor. See description below.

Calling your attention to our new Friction Chain Drive.

Crank shaft. Starts from either side.

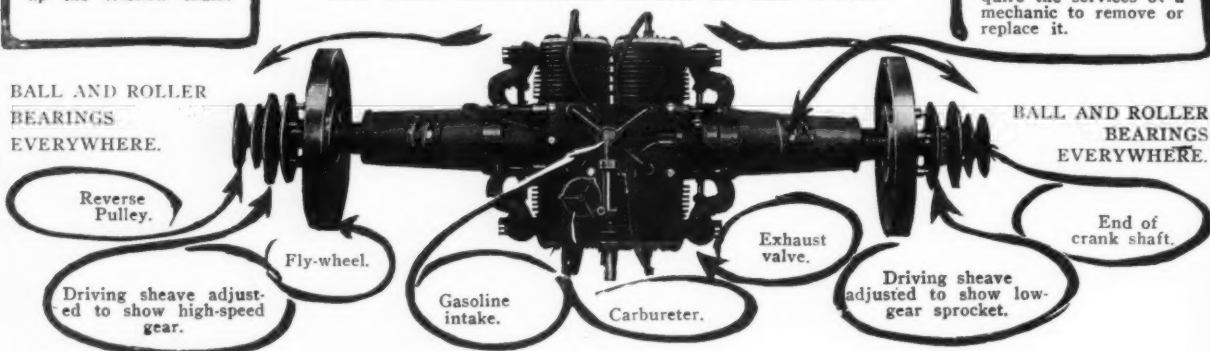
Direct drive from crank shaft to wheels without intervening gears or countershaft by moving up the friction chain.

We will exhibit at the New York Show, Grand Central Palace, Dec. 31 to Jan. 7
THE MOST REMARKABLE MOTOR IN THE WORLD.

The motor can be removed from the vehicle in less than five minutes by removing two bolts, and does not require the services of a mechanic to remove or replace it.

BALL AND ROLLER BEARINGS EVERYWHERE.

BALL AND ROLLER BEARINGS EVERYWHERE.



Reverse Pulley.

Fly-wheel.

Driving sheave adjusted to show high-speed gear.

Gasoline intake.

Carbureter.

Exhaust valve.

Driving sheave adjusted to show low-gear sprocket.

End of crank shaft.

SEND FOR CATALOGUE]
HOLSMAN AUTOMOBILE CO.,

Suite 339

Chicago, Ill.



De

E
ve
tin
bi
th
fo
wi

de
if

ty
re
th
tu
sis
co
er
bu
th
if
"A

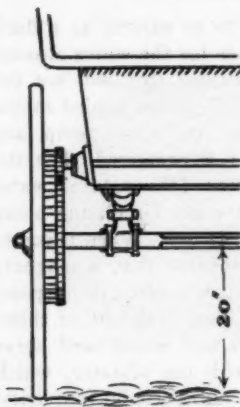
wi



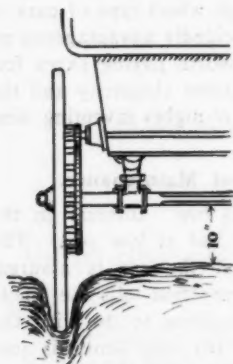
High Wheel Types of Automobiles



EARLIER examples of automobiles were, in point of general appearance, close in point of resemblance to animal-drawn vehicles of every kind. In the evolution of the car the pneumatic tires were found to be very desirable (having been tried out in bicycles), but the cost was found to be so very great as to debar the use of pneumatic tires with wheels of such diameter as were found on animal-drawn vehicles. Result: the diameter of the wheels was reduced to a point low enough to bring the cost of pneumatic tires to a commercial basis.



No Lack of Ground Clearance.



Makes Way in the Mud.

The automobile of to-day, then, is the evolution of the high-wheeler, primarily brought about because of the high cost of pneumatic tires. True, the automobiles were resolved into a distinct machine, involving a low center of gravity, a certain compactness, indicating high speed, great mobility, and all the other factors so well known, among which we must include reasonably good road beds. As the automobile developed along lines requiring good roads it was rendered more apparent every day that there was a legitimate zone of activity involving the high-wheel carriage type of mechanical car. When the high-wheeled vehicle made its re-appearance among the community there were many who regarded it as a mere adaptation of a horse-drawn vehicle for the sake of cheapness, independent of utility to any marked degree. Predictions of this sort were wide of the mark, since the designers of the high-wheeled vehicles had in view the negotiation of impassable roads (from the point of view of the automobile, with a low ground clearance) and they realized that the so-called buggy could make headway under conditions such as would be utterly impossible to any other type of vehicle. The mud roads of the Mississippi bottom

developed types of vehicles peculiarly suited to roads in which, if there was a bottom, nothing ever seemed to reach it.

The advocates of the high-wheeled type of car were well experienced in relation to the road conditions, and they kept uppermost in mind the features of construction along lines consistent with the requirements. They could not well improve upon the general features of the conventional buggy, and they were wise in that they did not bow to the clamor of the "pack," who would be most pleased if the automobile were to resemble an "Atlantic" type of locomotive.

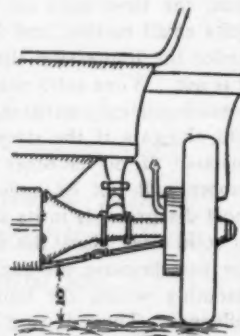
While it is true that the high wheel, with a view to increased ground clear-

ance and with a certain symmetry of shape, renders it possible to negotiate bad roads, it is equally true that the long spokes render the wheels pronouncedly resilient, and were we to put this by way of a law, we would say that the desirable properties of the spokes would be proportional to the cube of their lengths. This is equal to saying that a high wheel with long spokes has many, if not all, of the properties of a pneumatic tire. If pneumatic tires are used on wheels of less diameter, it is because the wheels have not the requisite properties, and they must use a pneumatic tire; whereas, with the high-wheel types of cars, the resiliency that resides in the wheels renders it unnecessary, to a large degree, to add further resiliency by way of pneumatic tires.

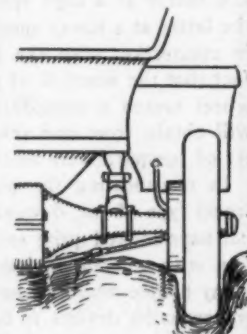
There was a certain definite limit to this reason, but the high-wheel types of cars are confined within that limit, and their utility is by no means reduced to that involving country roads in bad condition. These cars do excellent work on other than bad roads; indeed, it seems almost unnecessary to point out that if they will serve on bad roads, there is nothing to prevent them from excelling if the road conditions are improved. There is a certain economy from the point of view of maintenance in taking advantage of the resiliency of the high wheel to the exclusion of costly pneumatic tires, and it is a fortunate circumstance that the solid tires work better with a limited section than they would on a more extended basis.

Utility is the first consideration, and there is utility in the automobile on good roads, or the high-wheeled mechanical car on the roads not available for the standard types of automobiles. A thing is good if it looks good, and an automobile stuck in the mud does not look good, nor is it good. On the other hand, a high-wheeled type of car wading through that very mud does look good, and it is good. The incentive, then, is there; the car has its utility; it is cheap to build, because there is not so very much of it, and the builders of such cars are in a position to take advantage of the years of experience of the carriage makers.

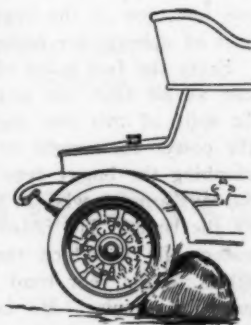
It is not to be supposed that the high-wheeled type of car will lend itself to enormous speed, nor can there be any good reason for wanting to go at racing speeds in cars that are designed to make reasonable headway on country roads. These cars are provided with 18 to 20 horsepower, as a general proposition, so that it cannot be said of them that they are inad-



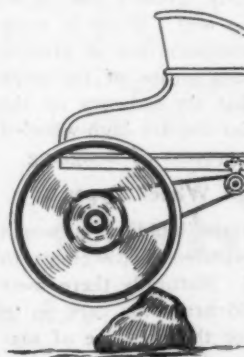
Usual Clearance of a Runabout.



Lacks Adequate Ground Clearance.



Insurmountable Barrier.



Mounting Obstruction.

quately provided with means of locomotion. Instead of being geared for high speed, they are geared to negotiate bad roads, which is a matter of considerable power and a high gear ratio. Even so, the average buggy-about will make 20 miles per hour on good roads, and under pressure it may do considerably better. This speed, in comparison with numerous runabouts of the past, compares very favorably, indeed, and for a doctor (for illustration) it is so much faster than anything possible with horses that the doctor will be justified in taking to the high-wheeler for good and all.

The Question of Tires.

It was pointed out how the automobile of the conventional type came to wheels of a small diameter (a matter of dollars). The high-wheel type of car became possible with the introduction of solid tires (rubber), the cost of which was not so great as to limit the diameter of the wheels below the diameters customary with carriages. There are one or two points in relation to this phase of the question that will bear discussion, as, for illustration, the tires used on the high-wheeled types of cars are of quite small section, and it is possible that many critics will labor under the impression that this is a matter of dollars, too. But it is not. When solid tires are used they should be of the smallest possible section consistent with the fact that they will flatten out and elongate if the stresses exceed the ability of the rubber to sustain. If, on the other hand, the tires are of liberal section, the rubber will not be sufficiently stressed, and a bouncing effect, most disagreeable in its action, will be the result. When it comes to solid tires, then, the smallest possible section will be the best for use, because the car will stay on the ground, and perform smoothly within the limits bounded by its legitimate sphere of influence. There is just this difference (fundamentally) between the pneumatic tires on the one hand and the solid tires on the other: The pneumatic tires should be as large as possible, and the solid tires should be the reverse.

The Transmission System.

Whatever the difficulties are when it comes to gearing a gasoline motor at a high speed to the rear wheels of an automobile, the latter at a lower speed, these difficulties are much accentuated in connection with the high-wheel type of car, because of the fact that the wheel is of great diameter and one revolution of the wheel means a considerably greater distance on the road than will obtain from one revolution of an automobile wheel, the latter of comparatively small diameter.

In transmitting the power of the motor, involving the high-wheel type of car, devices have been taken advantage of that may not have looked quite so mysterious as are the devices in connection with conventional automobiles. There are, perhaps, a great many people who may have labored under the impression that the transmission devices to be seen on the buggy-about are merely so designed to avoid cost. They can disabuse themselves of the idea, and were they in the position of the designer of the high-wheeled type of car, they would be subject to the same stress of circumstances, and they would have to bow to the same existing conditions. The difficulties are extreme, and the wonder is that the details of the transmission were so nicely worked out in so short a time, and that they worked out so well. While in some isolated instances the details of the transmission are in process of evolution, with strong hopes of evolving means of far more than ordinary merit, the fact remains that the industry on the whole is crystallized, and the patrons who require high-wheeled vehicles were well considered during the process of designing.

Body Work as It Relates to High Wheel Types.

The experience of a century of carriage building is worth something and that the result of this experience still clings to the cars of the subject is to be expected. Naturally there were influences to be considered such as would bring the cars up to date and to the requisite extent allow for the presence of machinery. That the machinery naturally would have to be taken into account is not to be lightly thrust aside, but it was a process

that did not result in destroying the fine points in bodymaking as they relate to the buggy type of automobile. In the high-wheel types it is necessary to have strength, but it is also important to eliminate weight. Indeed, if it is important to keep the weight down in automobiles in general, it is of far greater importance to depress the weight in this type.

Experience has taught the builders of this type of cars how to retain strength and at the same time avoid weight, which condition is contrary to the general expectation, from the point of view of the design of structures. In general it is the custom to expect weight if great strength is to be a factor. Under these conditions it will be a mistake to assume that the buggy body is used because it is low priced or for any other commercial reason, not taking into account the consideration involving appropriateness as the first requisite. In this service the several types of bodies are used just as in the automobile in general, in which room is afforded for from two to seven passengers, and space is included for the storage of tools or whatnot.

Some General Considerations.

Simplicity in a high-wheel car should be as natural as a duck in a mill pond. This same simplicity augurs for the entire absence of every possible device for whatever purpose that will not defeat the operation of the car. In this field the air-cooled motor makes it possible to eliminate the radiator, the water pump, and the piping. But if a water-cooled motor is preferred, then the thermo-siphon system of water circulation (the natural water system) renders unnecessary the use of a water circulating pump and such complication as will result from its use. When it comes to the ignition system, it is highly improbable that a magneto will be necessary, because the motors used are adequate in point of power, without having to squeeze the last drop out of them. It is even possible that an ordinary kick-coil would well serve the purpose, and by its use do away with the vibrator, which does seem to trouble a great many people with periodic frequency. If the ordinary kick-coil (known in modern and more elegant language as a step-up transformer) will serve on cars of some pretence, costing vastly more than the high-wheel type of cars, it is not too much to say they will prove decidedly advantageous on the cars in which extreme simplicity is worth paying extra for. The trend is in the direction of this extreme simplicity and the builders of these cars are staying awake o' nights inventing simplicity instead of complications.

Taking Into Account the Cost of Maintenance.

The first cost of the high-wheel car is low. Interest on the investment is low. Repair parts can be had at low cost. The tire situation is healthy. The utility of the car is assured. These five statements are as a word picture that tells the whole tale to the man who may have had anything to do with the subject at all. It is nothing short of utility that demands just what the high-wheel car affords. It is all very well to own and run a pleasure car of the conventional type under pleasurable conditions, but it is not all right to try to do the work of a buggy type with anything else but a buggy. Cost must be taken into account in the long run, and there are a horde of users of cars at the present time who find in the buggy type the very car they require. This is a fortunate circumstance, in which the low cost of the buggy type, coupled with its naturally low cost of upkeep, are fitting factors.

From the fuel point of view the buggy type has always stood out as all that can possibly be desired by conservative man. In spite of this fact the available power is adequate, in which the power for weight is at least up to general practice. In hill climbing the buggy type has done so well that it surprised the average autoist, who, in his egotistical way, failed to keep abreast of the times. He failed to note, for illustration, that the first automobile in which the motor is arranged to deliver power direct to the rear road wheels is of the very type he was so prone to despise. He failed to take into account the fact that the reason his wheels were not high was because he had not the inclination to pay the price to procure them.

Diamond Motor Buggy Special

**Made Especially for High Wheel
Automobiles**



For two years these tires have had a wide lead in this field. The same reasons that have made *Diamond Wrapped Tread Pneumatic Motor Tires* the equipment of more automobiles than any other two makes of tires combined, have put *our Motor Buggy Special* in a similar position in the high wheel field.

**Results—Results—Results—to Consumer—
to Dealer—to Manufacturer**

Note these prominent manufacturers who are regularly using Diamond Motor Buggy Special Tires

Burns Bros., Havre De Grace, Md.
Chas. E. Duryea, Reading, Pa.
The Buggy Car Co., Cincinnati, O.
Schacht Mfg. Co., Cincinnati, O.
Brush Runabout Co., Detroit, Mich.
J. V. Lindsley & Co., Dowagiac, Mich.
Fuller Buggy Co., Jackson, Mich.
Anderson Carriage Co., Anderson, Ind.
The Butler Co., Butler, Ind.
Fehring Carriage Co., Columbus, Ind.

Success Auto Co., St. Louis, Mo.

The Bendix Co., Chicago, Ill.
Holsman Automobile Co., Chicago, Ill.
International Harvester Co., Chicago, Ill.
Reliable Dayton Motor Car Co., Chicago, Ill.
Lincoln Motor Vehicle Co., Lincoln, Ill.
Chris Heckenhauer, Muncie, Ind.
Safety Shredder Co., New Castle, Ind.
Cushman Power Sprayer Co., Lincoln, Neb.
Economy Motor Buggy Co., Ft. Wayne, Ind.
Motor Buggy Mfg. Co., Minneapolis, Minn.

The Diamond Rubber Co.
Akron, O.

**Full 18-20
Horse-Power**
For Speed—
Dependability—
Economy Under
all Conditions of
Weather—Hills—
Mud and Sand—
With No Expe-
rience Necessary
**YOU CAN BANK
ON THIS CAR.**



See Exhibits at Big Shows

We will exhibit at the New York Show Dec. 31st to Jan. 7th and at the Chicago Show Feb. 6th to 13th.

In buying an automobile consider first cost, but hesitate longest to investigate up-keep and economy of fuel consumption. Buy a car where you can hold the maker to this guarantee. Insist on records of durability and the evidence of thousands of users' endorsements. We invite comparison of our catalogs—books—testimonials—which you can have for the asking. Write for them. But above all compare our factory facilities—expert workmanship—experience and the high quality of every part of

**THE INVINCIBLE
AUTO-RUNABOUT**

SCHACHT

with all others of this style car. Write us and investigate the meaning to you as an owner of a car like the Schacht. Full 18-20 horse-power—gearless—clutchless—Timken roller bearings throughout—easy riding long "Concord" springs—high, solid cushions, Goodyear rubber tires for economy of up-keep on all roads—Schebler carburetors, etc.—full high class equipment found only on high priced cars.

The Schacht is the easiest to run, simplest, most practical, most economical car you can buy—let us show you all the reasons why. Write for literature. If interested as an agent—let us make you our Special Proposition.

The Schacht Manufacturing Company
2721 Spring Grove Ave., Cincinnati, O.

Send me your latest
Invincible Schacht Auto-
Runabout Books and Literature
without obligation on my part.
Name.....
State.....
Town.....
Runabout free without obligation on my part.
721 Spring Grove Ave.,
Cincinnati, O.
SCHACHT
MFG. COMPANY

Tear this out, fill in and
mail for Schacht book free



THE "BUGGY CAR"

THE HIGHEST POWERED CARS OF THEIR TYPE MADE

"Buggy Cars" are a development of a knowledge of the needs of people who desire a high class, high powered runabout, good for service 365 days in the year, and that doesn't cost a king's ransom to buy.

A few specifications of "Buggy Cars" Nos. 4 and 5, 16 to 18 H. P. air cooled, 2 opposed four cycle engines; planetary transmission, 20 H. P.; two speeds forward, one reverse; one brake on counter shaft, one on transmission; steering lever at side with throttle attached; wheel base 70"; tread 56"; tires 1½ solid rubber; weight 1100 lbs.

"Buggy Cars" are simple in design and construction. Anyone can operate them and keep them in order. They are clean and slick in design, they are sturdy, reliable and efficient in every way—and proofs to this end await your asking—write to us to day.

The BUGGY CAR CO., John and Armory Sts., Cincinnati, O.

1909—ZIMMERMAN HIGH WHEEL AUTOMOBILES—1909



A LIVE PROPOSITION FOR A LIVE DEALER

4 MODELS FOR 1909. 3 RUNABOUTS AND A SURREY
Planetary or Friction Transmissions

**WE EXHIBIT AT
CHICAGO AUTO SHOW
FEB. 6th to 13th**

WRITE FOR CIRCULAR NO. 9 AND OUR AGENCY TERMS. SOME GOOD TERRITORY OPEN

ZIMMERMAN MFG. CO.

411 INDIANA AVENUE

AUBURN, IND.

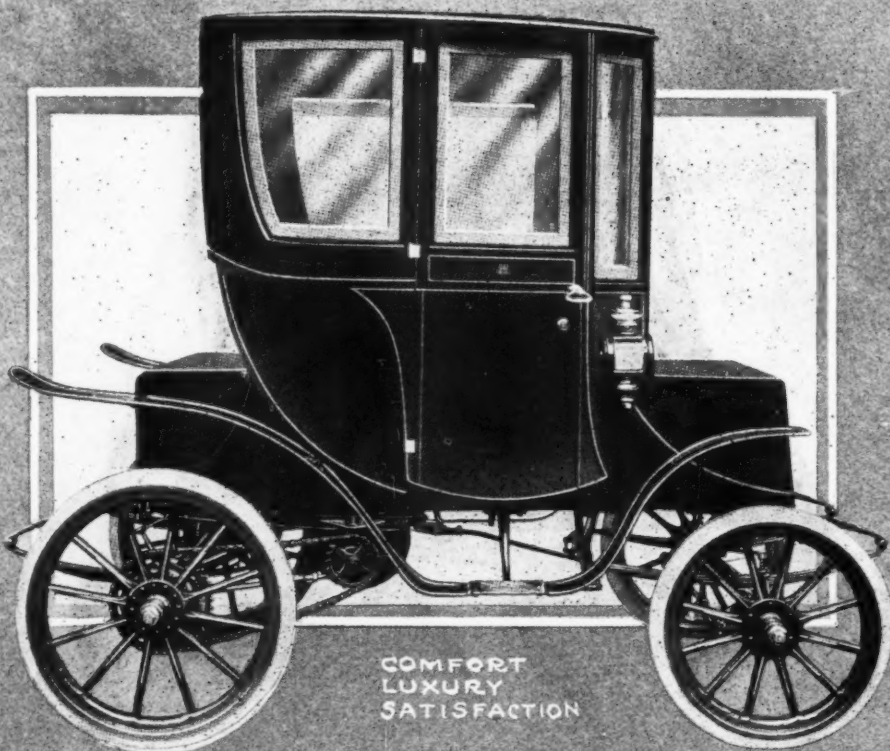
Electric Vehicle Section



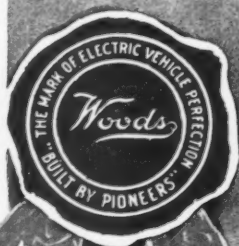
INCLUDING

The Several Examples of Electrical Vehicles, as Pleasure
Cars, Delivery Wagons, Cabs, and Trucks.

Woods



COMFORT
LUXURY
SATISFACTION



WOODS ELECTRIC

The world's greatest Electric carriage.

The carriage for particular people.

The mark of exclusive refinement and electric vehicle perfection.

WOODS ELECTRIC is included in most aristocratic establishments. That is because it is more easily and safely operated than a gasoline car and gives the supreme satisfaction as a city vehicle. Woods Electric has outstripped all competitors purely on merit. Have you heard of its wonderful achievements? Let us tell you about it. Write

WOODS MOTOR VEHICLE COMPANY

1408-10 Michigan Ave., CHICAGO

C
co
th
w
T
fi
ea
of
ch

ve
si
no
al
ve
in
na
wi
ti
th
as
fo

ch
ba
m
of
it
co
in
th
as
co
th
lo

th
ch
se
th
de
ar
ele
cia
th
ow
a

bo
str



CONCOMITANT with the advances in electrical vehicles were the improvements wrought in storage batteries. The success of the electrical vehicle depends almost exclusively upon the obtainable success of the battery. The question of the chassis was settled in common for the several modes of automobiles. The electrical motors as used in vehicles of this class were refined in connection with street railway and other work. In the early days, before the perfection of the chassis and the details of the electrical system, the problems were more diverse in their characteristics and far more difficult to solve.

The tire problem was more acute in connection with electrical vehicles, because the weight of the battery mounted up to a considerable figure. In some of the earlier types of trucks it was not uncommon to observe a weight of two tons in the battery alone. Gradual advances in battery construction resulted in a very material reduction in the total weight, and this reduction, in view of improvement wrought in tires, resulted in the elimination of what was long termed "impossibilities" in connection with electrical vehicles. True, there remains what is called the tire problem, but it has been reduced to a commercial basis, in that the electrical automobiles do so much and such good work as to earn excellent returns on the investment, besides settling for tires and the remaining costs.

In the early days of the electrical automobile the facilities for charging the batteries were so crude as to be indescribable. A battery follows very well-known, and fixed, chemical laws; it must be manipulated by a man who appreciates the significance of these laws, and every violation of any one of them carries with it a penalty. There was a time when experts in this line worked continuously with the idea of evolving types of battery, less in point of weight on the one hand, and of greater stability on the other. In the long run reliance was placed on the batteries as they are to-day, and when it was found that relief was to come by way of more careful attention to details, rather than through the good office of some revolutionary invention, things looked up a bit and the batteries thrived.

Carrying Capacity of Electrical Vehicles.

As a general proposition an electrical automobile will carry the equal of its own weight. The motor equipment is of such a character as to deliver the requisite torque under the most severe conditions of service. An electrical delivery automobile, then, will make headway on bad roads, up steep grades and in deep snow. They are not vehicles for speed, and while they are relatively slow, they are sure. Because of this reliability, electrical vehicles lend themselves to commercial work, especially to heavy short hauls, and if they are used continuously, as they should be, the batteries will serve best and earn for the owner of the car in every case the price of a new battery, plus a fair return, ere the battery wears out.

Electrical Pleasure Automobiles.

There is nothing that looks more pleasing than a little "piano box" type of electrical runabout, picking its way through busy streets or on boulevards with a lady at the lever. These little

cars are perfectly simple to manage; they obtain a speed of from 12 to 18 miles an hour and they rarely ever get out of order if the batteries are managed by persons of fair skill. These cars can be handled by almost any one at all and in connection with other automobiles in a well-equipped private garage they are extremely useful. There are other types of electrical automobiles that are well worth mentioning as, for illustration, town cars as broughams, victorias, landaulets and a type of cabriolet.

In the Service of a Busy Practitioner.

Medical doctors, in their practice, especially in the winter time, particularly appreciate comfortable and sure means of transportation. The first year that the brougham type of electrical automobile was introduced in the City of New York seventy-two doctors adopted this type of car for use in their service. Some of them complained that the cost was rather high, but none of them made complaint because their radius of travel was increased and their zone of activity brought them better returns. In the long run they tired of complaining, but they stuck to the brougham and, from all accounts, the quality of the service was improved from year to year until to-day it represents much of all there is of sturdy, reliable service and comfort in the extreme without defeating stability.

Wide Range of Uses Outside of Professional Zone.

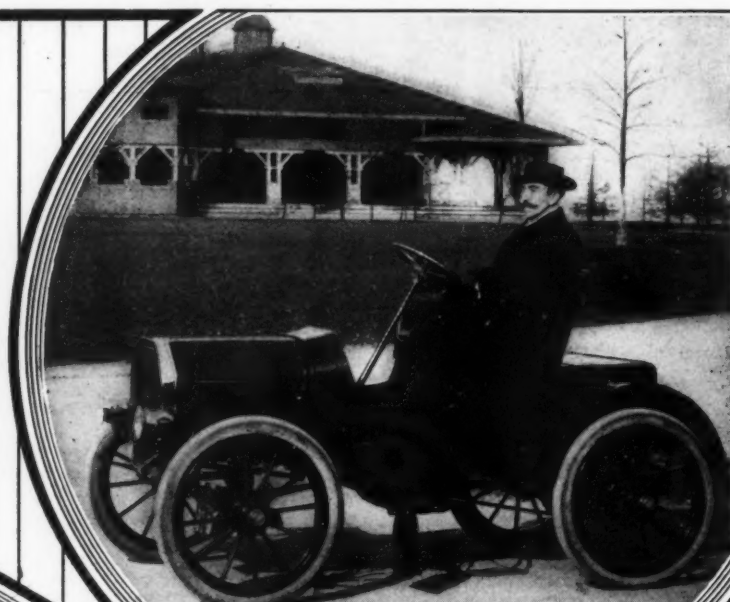
In private service the electric vehicle may be in divers forms. From the little car with the "piano-box" body to the most luxurious type of town car is a long way, and space forbids a detailed discussion. Moreover, the subject is well threshed out. Even so, it may not be far fetched to say a word or two by way of calling attention to the fact that in various ways consistent with the well-known abilities of the "electric" the service has been on the increase to a very great extent. From early morning to late at night the cars of this class can remain in constant service, beginning with the safe and comfortable delivery of the master of the house to his office in the morning, by which time madam will command the attention of the car for a shopping expedition. In the afternoon the same car will be available for calls or a roll on the "boulevard," unless it is that some special function intervenes. In the opera season the car will be in much demand, in which service it has long riveted the attention of autoists. The time was when the service that a battery would render did not permit of a schedule such as this. That time is past; the batteries now embody the requisite qualities, which was very adequately proven recently, when a car of this class made a touring trip from Colorado to New York, under its own power, over roads such as were long looked upon as entangling propositions for even pretentious touring cars.

Facilities for Charging.—In the early days the question of charging the batteries was so formidable as to retard progress. This phase of the subject made enormous strides until to-day batteries can be charged in garages in every hamlet in the land and in dozens of stations in the large centers. These battery charging stations are beehives of industry.

An Electric Sensation

The Model R Baker Electric Runabout that will be exhibited for the first time at the New York Automobile Show—Madison Square Garden, January 16-23—has created a sensation among builders of electric vehicles. A Runabout especially designed for professional and business men—this new model, swift and easy of control in congested streets, opens a new era in electric vehicle construction.

The mileage of the Baker Runabout—at the speed at which this car runs—is phenomenal. It is the most efficient car ever turned out by the Baker Factory—the greatest factory in the world devoted exclusively to the manufacture of Electric Vehicles. Its mileage is 30% to 50% greater than any other electric made, and many owners do not charge the Baker Runabout until they have negotiated at least 100 miles.



MODEL R
Baker Electric Runabout

The Most Remarkable Car Exhibited at the New York Automobile Show

Do not fail to make a memorandum to see the Baker Runabout when at the New York Show. The fact that we cannot manufacture these cars fast enough to supply the demand is the best evidence that this new model has demonstrated its superiority over every other type of gasoline or electric runabout. Strong words—but Facts are Facts.

We Want Reliable Agencies

In cities where we have no agencies at present. Our aggressive campaign for 1909 will make the Baker Agency very desirable. Write to-day for our "Special Agency Proposition."

Baker Electrics don't get "tired" or need a "rest" in a garage. They are 100% efficiency.

Our "trouble man" is on a vacation. The "Time-Tested" Baker is unequalled.

Our catalogue, describing our complete line of Baker Electric Coupes, Runabouts, Victorias, Landaulets, Broughams, Surreys and Commercial Vehicles, will be sent you on request.

**We Are
The Largest
Exclusive
Electric
Automobile
Manufacturers**

Baker Motor Vehicle Co.

20 West 80th Street, Cleveland, Ohio

NEW YORK SALESROOM:

1788 BROADWAY



1060 Miles in a Detroit Electric from Detroit to Atlantic City

Talk About Endurance!

HERE'S an actual picture of actual road conditions encountered by the Detroit Electric on its run from Detroit to Atlantic City, a distance of 1060 miles.

The car that made this trip was not especially prepared for it.

Its equipment was identical in every particular with the cars we supply Detroit Electric purchasers.

The batteries were standard batteries, and the tires were standard six-ply tires.

This car carried two passengers and about 150 pounds of baggage, including extra casings, etc.

It arrived at its destination without a broken part and without once having been assisted along the way.

No other electric car ever before made such an overland trip—no other electric car ever before overcame such tremendous difficulties. This wonderful run demonstrates beyond any possible gainsay that the Detroit Electric is the peer of them all.

Write for Interesting Booklet

We have had a full account of this trip written up, in a very interesting booklet. It is illustrated throughout from photographs made along the route. This booklet will give you an idea of the nature of the trip made by the Detroit Electric, and the difficulties encountered—please write for it. We will gladly mail it to you with our compliments. We will also send you our handsome brochure, showing seven different styles of Detroit Electrics for use everywhere, and prices. Address

140 Miles on One
Charge, 12½ Miles
Per Hour

Anderson Carriage Company, Station C, Detroit, Mich.

Agency Correspondence Desired

MEET US AT NEW YORK, JAN. 16-23; CHICAGO, FEB. 6-13

Our Cars are
Designed for Room
and Comfort

**Unapproachable
QUALITY of the**

BAILEY ELECTRIC



The latest and best in Electric Motor Car construction.

Easy control and steer.

Clear access to all parts.

Fast enough and far enough.

AGENCIES DESIRED

S. R. BAILEY & CO., Inc., Amesbury, Mass.



THE PERFECT ELECTRIC COUPE

Perfect in every department—as cozy and luxurious as any woman would have it—as able and efficient as any man would demand it to be.

Nothing is skimped in this car.

It is by far the handsomest coupe on the market to-day.

Write for our catalogue describing mechanical features that will at once convince you that it's the soundest and strongest car of its kind in America.

See our exhibit at the New York and Chicago Shows. See if you know of a car half so good.

Any of the following agents will be pleased to demonstrate.

THE RAUCH & LANG CARRIAGE CO.

Dept. A, 2180 W. 25th St., Cleveland, O.

55 YEARS' EXPERIENCE BUILDING FINE CARRIAGES

CHICAGO, ILL.—C. P. Kimball & Co., 315 Michigan Ave.

DETROIT, MICH.—Wm. P. Neumann & Co., 1342 Woodward Ave.

ST. LOUIS, MO.—Union Electric Light & Power Co.

TOLEDO, OHIO—Toledo Motor Car Co.

DAVENPORT, IOWA—Mason Carriage Co.

MANCHESTER, N. H.—Jas. A. Wellman, Pembroke Building.

OMAHA, NEB.—J. J. Deright & Co., 1010 Farnam Ave.

PHILADELPHIA, PA.—Bergdoll Motor Car Company.

ERIE, PA.—A. H. Murphy, 918 State St.

LIMA, OHIO—Wm. E. Rudy.

BROWN MOTOR CAR CO.—Buffalo, N. Y.

LUBECK AUTOMOBILE CO.—Grand Rapids, Mich.

OKLAHOMA CITY, OKLA.—A. F. Binns.

CANTON, OHIO—Diebold Motor Car Co.

DENVER, COLO.—Colburn Auto Co., 15th and Colfax Ave.

KANSAS CITY, MO.—Fletcher Cowherd, Jr., Auto Co.

BALTIMORE, MD.—Rice's Garage, North and Madison Aves.

ST. PAUL, MINN.—F. W. Ramaley, 650 Grand Ave.

ROCHESTER, N. Y.—Arthur McNall, South Union and Court Sts.

GOSHEN, IND.—Goshen Auto Co.

MARIETTA, OHIO—H. B. Coen, 25 St. Clair Building.

SPRINGFIELD, ILL.—R. Haas Elec. Co., 300 E. Monroe St.

ATLANTA, GA.—M. Rich.

CINCINNATI, OHIO—Herschede Motor Car Company.

FT. WAYNE, IND.—Ohnhaus Automobile Co.

MUTUAL MOTOR CAR CO.—Pittsburg, Pa.

AUTO INN.—Lafayette, Ind.

1909 BABCOCK ELECTRICS

Perfect Electric Carriages in Every Part. Representing the Very Highest Development in Electric Motor-Car Design and Construction.

For reliability, ease of operation, cleanliness, high speed and comfort

BABCOCK ELECTRICS

are beyond comparison. They give more actual, dependable service, day in and day out the year through at a lesser proportionate cost of operation, than any other type of motor vehicle.

A few points of superiority are:

LUXURY ECONOMY
SAFETY SPEED
COMFORT SILENCE
HILL CLIMBING
STYLE
DURABILITY

MILEAGE

SIMPLICITY

Full information on request,

Write to-day

Babcock Electric Carriage Co.

BUFFALO, N. Y.



Whys and Wherefores —of the— Automobile

A SIMPLE explanation of the elements of the Gasoline Motor Car, prepared for the Non-Technical Reader. Over 100 illustrations, twenty-five chapters. Bound in leather, flexible covers.

SIZE OF BOOK 5x7 INCHES

Price, \$1.00, postpaid

THE AUTOMOBILE

231-241 West 39th Street

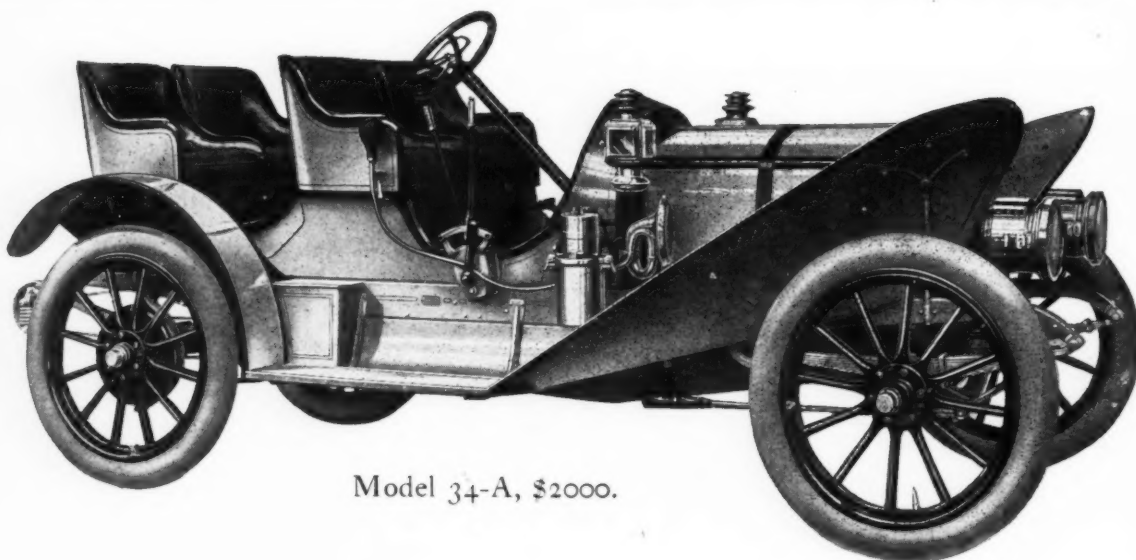
New York

Roadster and Runabout Section



INCLUDING

All Cars Below the Light Touring Car Class.



Model 34-A, \$2000.

A BIG RAMBLER YEAR

Dealers who have shared the Rambler success of the past year—a big Rambler year—know of the absolute satisfaction the new Ramblers have given.

No other make at anywhere near Rambler prices approaches the Rambler in quality and exclusive features. The line to be exhibited at the Rambler show, 38-40 W. 62nd St., New York, includes some new models never before shown. These will interest every live dealer in open territory.

Rambler
The Car with the Offset Crank Shaft

Have you seen the Rambler Spare Wheel operated? Call at the Rambler show and we will demonstrate to you how it can be substituted for the regular wheel within three minutes.

During all New York shows Ramblers will be shown and demonstrated at the new Rambler Branch, 38-40 W. 62nd Street, New York. Telephone Columbus 4511; give your address and we will call for you.

Thomas B. Jeffery & Company
Main Office and Factory, Kenosha, Wis.



WITH the final separation of the runabout from the light touring car, the runabout as a type stands alone, and is limited in its application to just the service it was originally intended to satisfy. This is fortunate for the runabout, because its reputation has sustained severe injury in every case in which the little car has been compelled to "tote" a tonneau.

In a way, the extra service imposed upon the runabout types has augured for advancement in that the wheelbase and other essential dimensions were increased from time to time, in the evolution of the runabout, in the direction of the light touring car. The wheelbase should be more than it was in earlier times, because easy riding qualities do not abound in conjunction with speed and a contracted wheelbase, although it is true for every wheelbase lengths there are limits of speed wherewith the car will perform satisfactorily.

It is not now uncommon to find runabout types of cars with even four-cylinder motors rated at approximately 20-horsepower, while double opposed motors of from 15 to 20-horsepower are common, and the single cylinder motors are designed to be from 10 to 14-horsepower, so that the power available in nearly every single instance indicates that the wheelbase should be long. Fortunately, for the patrons of the industry, designers have not been stingy in this direction.

The earlier examples of runabout types of cars were designed with a wheelbase even as low as 60 inches, while to-day it is not uncommon to observe cars in which the dimension referred to even exceeds 90 inches. There is all the difference in the world in the performance of a car with a 90-inch wheelbase as against the performance of a car with even 80-inch wheelbase, and when it comes to the performance of a car with a 60-inch wheelbase, the speed is absolutely limited to a point far below that at present attainable.

Relations of Speed, Weight, and Power.

If a car is too light, it will be limited in speed in considering easy riding qualities, because it will not stay on the ground. On the other hand, if a car is too heavy, considering the power of the motor, it will not attain speed. There is a very intimate relation, all things considered, between the power of the motor, the weight of the car, and the obtainable speed. To reflect the entire situation, it will be necessary to call attention to the fact that the attainable speed is a matter involving the diameter of the wheels as well.

The more recent products come very close to perfection in these respects, and designers are alive to the fact that it is useless to add power without affording the conditions essential to the utilization of the same. The same designers learned that it is futile to add weight if the addition is in the vertical plane instead of through the good office of a lengthened wheelbase, and they fully realize that the weight of an automobile should be measured in pounds per foot of length, which is not to deny that fully 60 per cent. of the total weight should be concentrated at the point of contact of the driving wheels.

The Transmission and Means of Control.

It is in the runabout type of car that the planetary gear is in its right element. It is sometimes said of the planetary gear that it is "fool proof." This appellation is not only crude, but it

fails to represent the splendid qualities of the planetary type of gear. Among the noteworthy virtues of this type of gear will be recorded its absence of any considerable weight in pounds, the small space it occupies, and the fact that it can be stowed away in a more or less obscure situation, because it is completely housed in and there is no occasion for getting at it while it is in working order, nor would it be an advantage to be able to get at it were it out of order. The planetary type of gear has all the virtues of a chronometer. When it works, which it does for a long time, it requires no attention whatsoever, unless to keep the cavity more or less full of oil, and when it wears out, to replace it is the natural thing to do. This type of gear is much used on the runabouts at the present time, and it is even used on some touring cars, which is an indication of its ability quite in excess of the needs in so far as the runabout type of car is concerned.

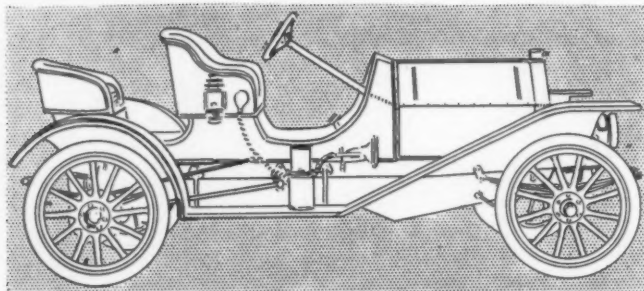
This type of gear gives two speeds and reverse. In the high speed, the gears and pinions remain still, and the whole unit revolves. The gears thus locked are noiseless; equally it is true, they are subjected to no actual wear at all. The cars are light enough considering the power of the motors, so that it is a very bad road indeed requiring the use of the low gear. The control is so perfectly simple, and so free from any complication, such as would make it possible for the system to get out of order, that it is easy enough to account for the appellation of "fool proof."

The runabouts are not all of the shaft-drive genera, although the shaft drive is more predominate in connection with runabouts than it is with cars of more power. The length of the propeller shaft is invariably a maximum, because the planetary gear is short, and the motor, too, takes up a very little of the available longitudinal distance. Even if sliding gears are used, to which there can be no possible objection (on the ground that they even work in the very largest types of cars), they will not take up a great length in the runabout types, because they do not have to be designed to transmit a large amount of power. It is a matter of expediency, as between the two types of gears, the shaft or the chain drive, the live rear axle or not. Each of the types are represented and merit resides in the cars of the respective methods of construction.

The Utilization of Space.

If the motor is under the bonnet in front, and the front line of the cooler is even with the center of the front axle, which is true in most of the cases, the front edge of the seat comes about 48 inches back of the center line of the axle. Considering the proper depth of the seat and depending upon the wheelbase, the free space back of the seat approximates 30 inches. This space can either be used in connection with a rumble seat, or it affords a very roomy platform or place for a box of light construction for any utility purpose. The rumble seat is much in vogue at the present time. It is positively a great advantage to have one, and if the gasoline tank is located elsewhere, a space under the rumble seat becomes at once available for a tool box.

In the past very little attention was given to the utilization of the available space; in many cases it was even difficult to find a place in which to store such tools and accessories as positively must be taken along with the car. In the best examples of the



Typical Roadster Type That Has Won Popularity.

runabout type of cars to be seen to-day the small details are adequately cared for and the cars of the type under discussion will serve many useful purposes. They become the ideal doctor's rig, increasing the radius of practice, assuring ability to keep appointments, and they perform the service at a cost below that of the horse-drawn carriage.

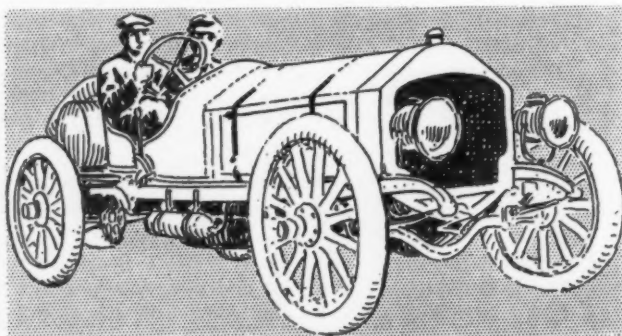
The Fuel Consumption.

The best types of single cylinder runabouts will make from 20 to 30 miles on a gallon of gasoline, and the quantity of lubricating oil required per mile is almost negligible. Increasing the number of cylinders seems to have the effect of increasing the fuel consumption for a given travel, the reason for which lies very largely in the fact that with increasing power the obtainable speed is greater, and reasonable autoists must expect to pay for a little more fuel if they attain a considerable increase in speed. Under certain conditions it is economical to use more gasoline, because with increasing speed more distance can be covered, which is an advantage that can be measured in dollars. When the advantage in dollars considerably exceeds the cost of the increased fuel, it is high time to fix the conditions requiring the increased fuel.

In some of the earlier examples involving the double opposed motor, the fuel consumption was augmented through the imperfection due to the use of a carbureter for each cylinder. This defect, like a great many other minor imperfections, has disappeared, and in the most up-to-date type of these cars as seen to-day a further fuel economy may be anticipated because of improvements in the ignition system.

The Spring Suspension.

The runabout types of cars with the positively short wheelbase were rendered easy riding through the use of "concord" (buckboard) types of springs, but with increasing length of the wheelbase the concord types of springs were abandoned, in view of the difficulties involved resulting in sagging on an unequal basis. It took some little time to design half elliptical and even full elliptical springs, such as would afford a certain suppleness of action without coming down on the axles. Like everything else, it as a problem that has been fairly solved, and the spring action of the runabout types of cars is up to a fairly high standard at the present time. Referring to springs in the "roadster" types of cars, it is to note practices more nearly in accord with



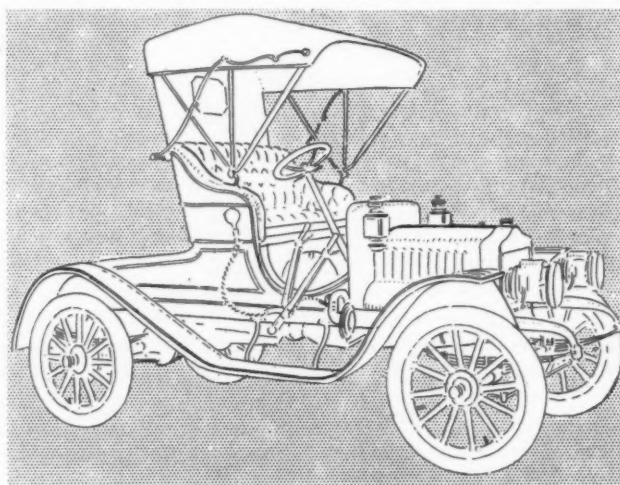
High Powered Type of Roadster—a Fast Goer.

the spring suspensions as they obtain in touring car work. As a general rule, the roadsters are of the high power class and the body weighs more than in runabouts; the result is the springs have to be wider, have more leaves (plates) and the length of the springs are greater. When roadsters are merely runabouts with roadster bodies, then, of course, the springs do not undergo change. Probably the greatest advance in relation to springs is in the use of much finer materials for the purpose than any before known, in or out of the automobile zone of activity. The old idea of high carbon steel has been superseded by products in which the carbon content is relatively low.

The Body Work.

It is pleasing to note that the bodies of the runabout types of cars are now on a high plane. It finally became a recognized fact that the runabout types of cars filled a niche on a utility basis, and that they were more for utility than they were for pleasure. Under such conditions, the bodies have to stand more washing, the cars are more likely to be out in inclement weather, and the cheaply constructed wooden affair would scarcely serve for any length of time with such arduous work.

The new types of bodies have a certain straight line effect that is positively agreeable in contrast with some of the earlier phantasies, and if they are made of wood they are put together



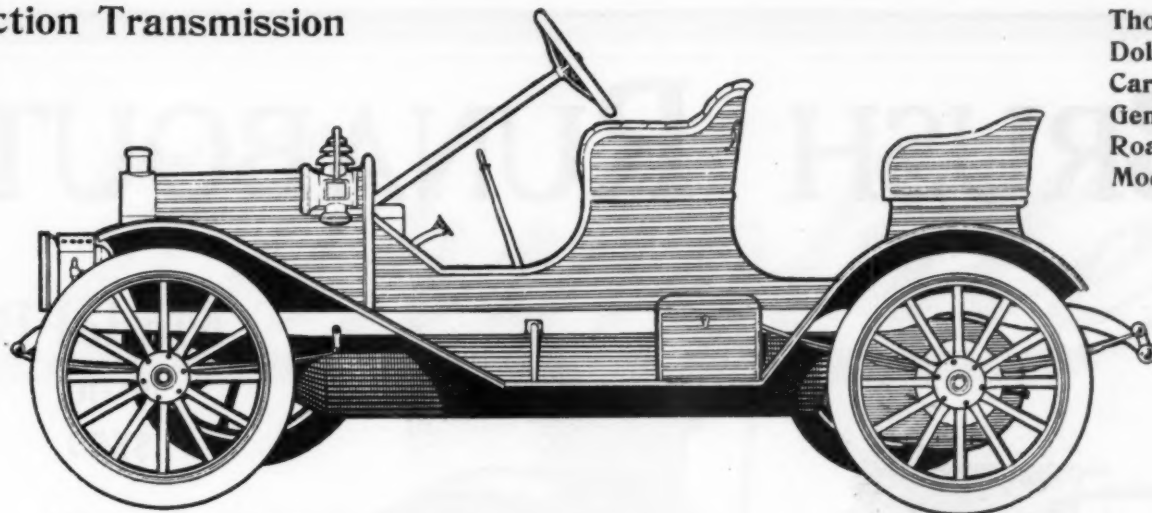
Doctor's Runabout—a Type Popular with Physicians.

in a definite way, rather to the exclusion of glue and putty. Many of them are made of metal, and on the whole they will stand inclement weather, the washing, and the service. Another point in relation to the finish: the idea of the high carriage finish is a little out of place on a runabout, and a very sensible practice of using a fine grade of paint made of lead with a little zinc and pure oil, colored to suit, is taking the place of an expensive carriage finish, and properly so. The finish on the latter-day cars has the virtue of costing very much less, of looking better in the long run (service considered), and the paint acts as a preservative for the body, preventing the wood from checking and the iron from rusting.

The Last Word.

In a hundred ways, the details of the runabout types of cars are on a far higher plane than they were before. A reflection of the trend of the runabout industry would seem to indicate that it will be one of the largest and most important branches of the automobile trade in the not far distant future. These cars are economical to maintain, they are speedy enough, they are a utility proposition in divers ways. No matter how many big automobiles an autoist may have in his garage, he cannot afford to be without a runabout any more than a battleship fleet can afford to be without torpedo boats. The runabout types of cars are, as it were, the "mosquito fleet" of the automobile squadron, and they are just as necessary (because of their nimbleness and utility) as any of the other cars.

Friction Transmission



Thousand
Dollar
Cartercar
Gentlemen's
Roadster
Model "H"

Become a Motorist Without a Motorist's Troubles

Many have come to believe that "troubles" are a necessary part of motoring—

The thorns that come with roses.

Their experiences have never been different.

The clutch — the geared transmission — the universal joints—the bevel gears—the water pump—all have come in for their share of "trouble."

The Cartercar eliminates troubles by doing away with the troublesome parts with its Friction Transmission.

It is a simple car—so simple, indeed, that there is hardly anything to get out of repair.

It has no clutch to slip—

No gears to strip—

No grease packings to renew—

No water pump to clog—

No noise to annoy—

And only one control lever.

If you have driven other automobiles you will better appreciate what this means.

The Cartercar has a thousand speeds. You can travel

from zero up to forty miles per hour.

You can follow a loaded truck on a crowded street without danger of stalling the motor, or speed to your heart's content.

The Cartercar will travel any road any automobile will travel and many that others will not.

It will climb a 50 per cent. grade with a full load.

With our patented aluminum housing the chain runs in a bath of heavy oil, protected from dust and dirt.

It makes it absolutely noiseless, and in connection with our Friction Transmission, is the smoothest running drive yet invented.

The fundamental principles in the Cartercar have always remained the same. Changes have been of a refining and modernizing nature.

It is not an experiment nor the untried product of an overconfident engineer.

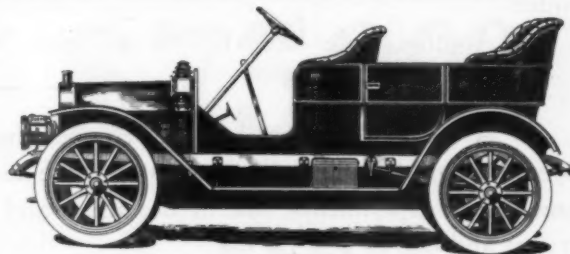
The Cartercar is a high-grade, practical automobile of the finest type.

If you are already an automobilist—if you are about to become one—Be a Motorist Without a Motorist's Troubles.

Agents who have sold the Cartercar year after year to their nearest friends will tell you about it.

They will tell you of those who have driven over 4,000 miles and have spent only \$3.00 for repairs—of 4,500 mile trips without even tire trouble—of 7,000 miles in six months for less than \$100.00—and of boys who take all the care of the cars in their father's garage.

Write and we will give you the nearest agent's name and forward literature about our Model "C" Delivery Car, Model "E" folding Tonneau, Model "G" Roadster, Model "H" Thousand-Dollar-Runabout or Model "K" five-passenger Touring Car, Taxicabs, Coupes and Landaulets.



New Model "K" 5 Passenger Touring Car, \$1350

It is a beautiful, high grade car with handsome lines conforming with the latest ideas of comfort and class.

A strictly family car for city use or extended touring. It is light in weight, roomy, and the easiest riding car ever produced.

It has our simplified, double-opposed 22-24 horsepower motor.

Carburetor, commutator, etc., easy to reach and adjust.

Lubricator under the hood over motor, avoiding dirt and grease.

Carter patented Friction Transmission, one lever control, noiseless chain drive in dust and oil-tight aluminum housing.

Pressed steel frame of arched pattern giving great spring action.

Long, easy riding springs.

Large, quick detachable tires, 32 x 3 1/2 inches.

A wheel base of 103 inches.

Equipped with three oil lamps, horn, mats, complete set of tools, and tire repair outfit.

Price, \$1350, f.o.b. Pontiac.

See us at the Grand Central Palace Show, New York, December 31 to January 7.

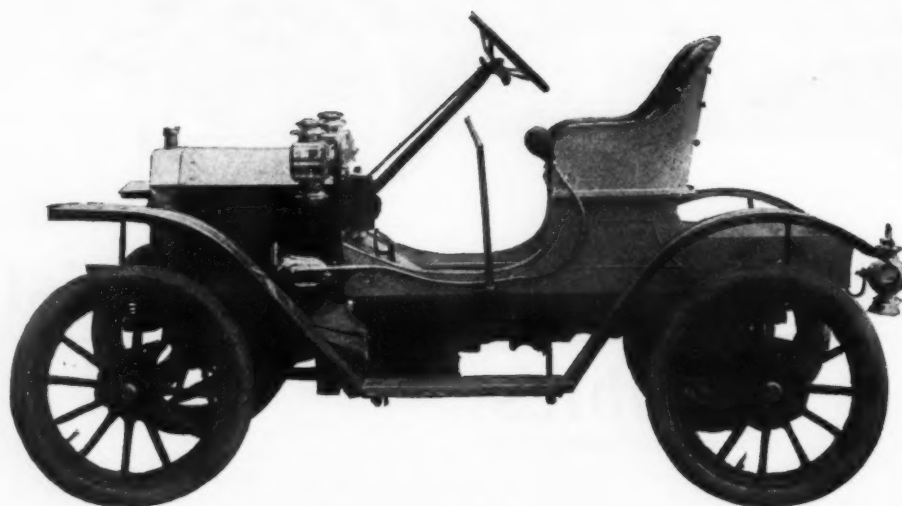
Chicago Automobile Show, February 6 to 13.

Cartercar Company

Pontiac, Mich.

Member
A. M. C. M. A.

BRUSH RUNABOUT



Model B

\$500

\$550

Delivery Wagon

\$600

See us at the Palace Show,
New York, Dec. 31-Jan. 6

In a certain Michigan town of 1200 inhabitants a live business man took the Brush Runabout agency last August. So far we have shipped him 12 cars and have (at this writing) his order for another carload of 6.

A Western dealer contracted 100 cars for his town for the balance of this Fall and all of next season. Up to December 15 we had shipped him four carloads of 10 each, or 40 cars, with more on order.

Another dealer has taken 60 cars since September.

A small car is a much harder engineering and manufacturing problem than a big car. We have been through the mill. Since the start there have been four years of effort put on the Brush Runabout—one year of experiments, one of designing and testing, one of manufacturing organization and public tryout and one of general use.

It is no dream or hope. We need no dogs to try it on.

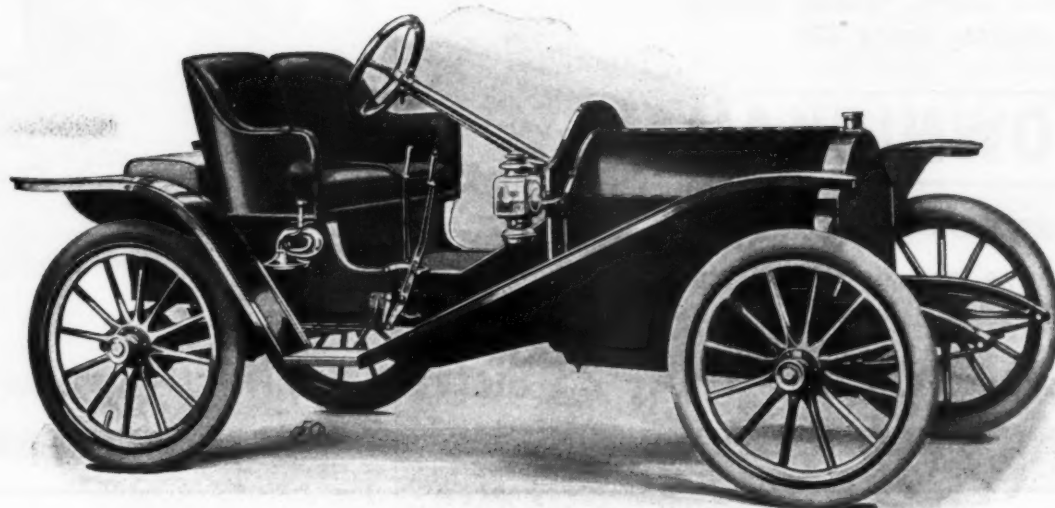
The car is right because people who drive it find it so. The price is not going up nor the quality down, because we KNOW our costs, basing that knowledge on actual past experience in quantity production of THIS CAR. We CAN AFFORD to make every piece in it good. The car sells. Note we don't say "will sell." IT IS SELLING. The profit STICKS TO THE DEALER because he doesn't have to spend it all in free repairs.

Do YOU want territory on it? Some of the most prominent dealers are selling it. It is the BUSINESS MAN we wish to tie up to.

BRUSH RUNABOUT COMPANY, Detroit

Members A. M. C. M. A.

Hupmobile



\$750⁰⁰

\$750⁰⁰

Four cylinder 16-20 H.P. Water Cooled Motor. Sliding gear transmission. Shaft drive. **Bosch High Tension Magneto.** Starts on half turn of crank, dispensing with coils, batteries and connecting wires. Weight complete with equipment 1100 lbs. Wheel base 86 inches. Designs by E. A. NELSON.

Speed 45 Miles an Hour

HUPP MOTOR CAR CO., Bellevue and St. Paul Aves.
DETROIT, MICH.

WHEN YOU WERE A BOY

(IN THE DAYS OF THE BICYCLE AND PONY)

Don't you remember the pride and pleasure you experienced in the ownership of either? To-day your boy can own "a real Motor Car" at a cost no greater than your boyhood's possessions and combine instructive amusement with perfect safety. Write for illustrated catalogue to-day.

New York Show, Grand Central
Palace, Space 209

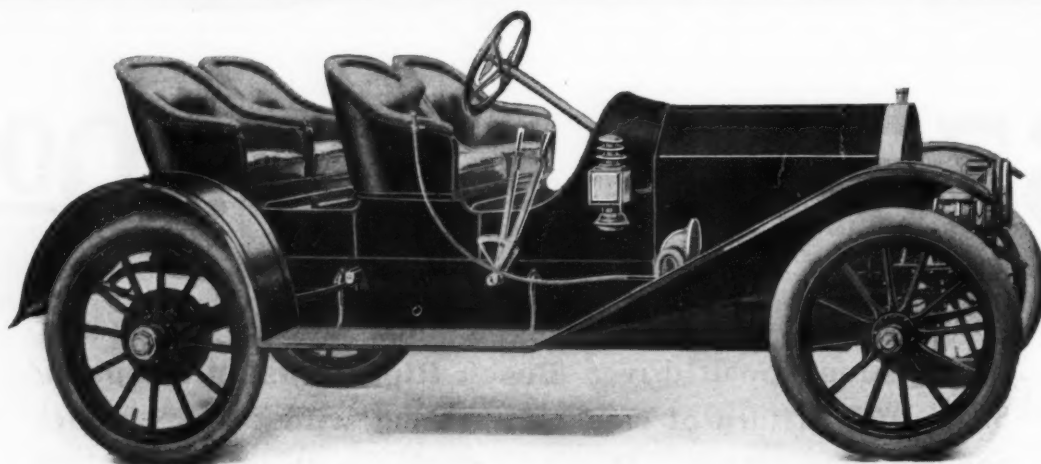
BROWNIEKAR

Price, \$175.00 F. O. B. Factory

We have a proposition that
will interest the dealer.



OMAR MOTOR CO., 25 Siegrist St., Newark, New York



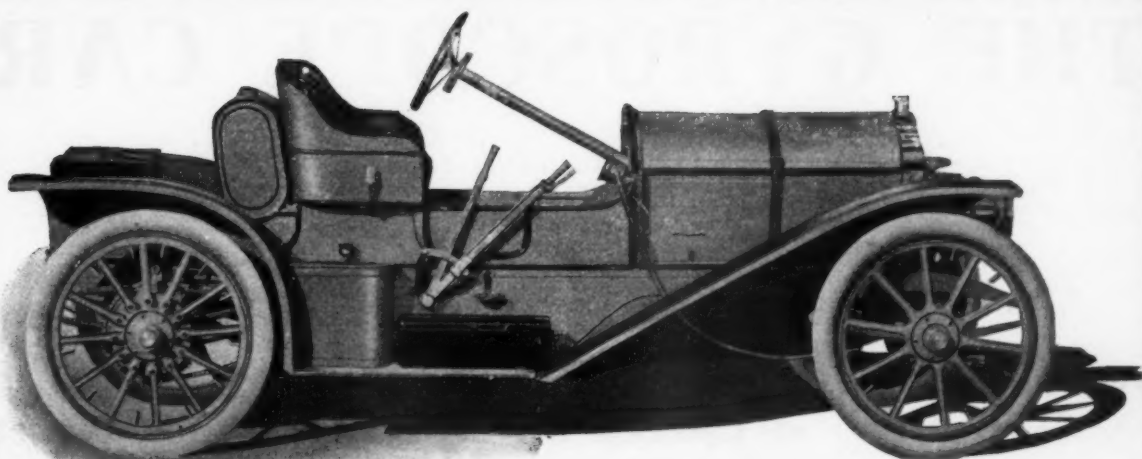
THE McCUE CAR

THIS CAR has a 30-horsepower, four-cylinder motor with double ignition, Bosch magneto and battery, selective type transmission, floating type rear axle, I-beam front axle, artillery wheels with 36 x 4" tires, and actually weighs 2,020 pounds. The wheel base is 117"; track 56". It is a high-class roadster in every sense of the word and will stand the most critical examination.

We would like to tell you all about it. May we send you our catalog?

The Roadster and Touring Car will be exhibited at the Grand Central Palace and Boston shows.

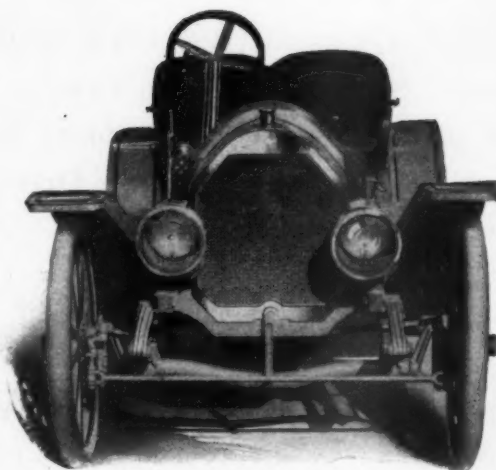
THE McCUE COMPANY, Hartford, Connecticut



PETREL

PETREL "6" ROADSTER \$2,500.00

Motor—6-cylinder, $4\frac{1}{2} \times 4\frac{1}{2}$.
 Ignition—Double, with U & H Magneto, with self-starting attachment.
 Cooling—Water Centrifugal Pump.
 Drive—Waite Friction, Double Chain.
 Frame—Pressed Steel.
 Wheels—Salisbury Artillery.
 Tires—36x4.
 Gasoline—Tank Capacity, 20 gallons, Gravity Feed.
 Upholstery—Plain Imported Patent Leather.
 Wheel Base—116".
 Standard Color—English Violet with Black and Gold Striping. Piano Finish.
 Equipment—Full set Electric Lamps with special 6-80 battery, 50-hour capacity; Horn, Speedometer, Tool Kit, Trunk with two suit cases.
PETREL "6" TOURING CAR—Same specifications with 5-passenger body, no trunk, \$2,600.00.



PETREL "4" ROADSTER \$1,350.00

Motor—4-cylinder, $4\frac{1}{2} \times 4\frac{1}{2}$.
 Ignition—Battery and coil, Jump Spark.
 Drive—Waite Friction, Double Chain.
 Frame—Pressed Steel.
 Wheels—Salisbury Artillery.
 Tires—32x3 $\frac{1}{2}$.
 Gasoline—Tank Capacity, 20 gallons, Gravity Feed.
 Upholstery—Plain Imported Patent Leather.
 Wheel Base—106".
 Standard Color—English Violet, with Black and Gold Striping.
 Equipment—Full set Lamps, Horn, Trunk with two suit cases.
"PETREL 4" TOURING CAR—Same specifications, with 5-passenger body, 115" wheel base. No trunk, \$1,500.00.

**"Petrels" are Silent, Sure, Swift. Get There.
 Look and Sound Well While They Do It.**

PETREL MOTOR CAR CO., Kenosha, Wis.

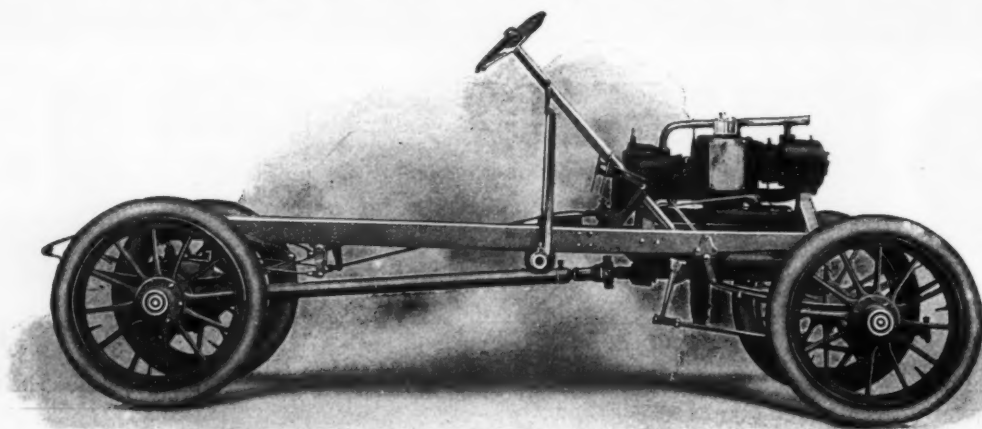
THE GYROSCOPE CAR

The Simplest Automobile in the World

After the initial cost of a car, the possibility of extending and repeating sales depends most on the upkeep.

**The Gyroscope Car Has the Lowest Cost
of Upkeep of Any Car on the Market**

AN IDEAL CAR FOR PHYSICIANS



THE GYROSCOPE CAR HAS
No Clutch. No Change Speed Gear. No Crank. Starts from the Seat.
Horizontal Fly Wheel, giving Gyroscopic Stability in Running. No Skidding. Takes Turns at Any Speed. Friction Drive. Absolute Control.
16 H. P. 35 Miles per Hour.

Runabout, \$750. Tourabout, \$800. Touring Car, \$850. Taxicab, \$1250.

GYROSCOPE AUTOMOBILE COMPANY (Inc.)

GENERAL SELLING AGENTS AND DISTRIBUTORS

GYROSCOPE BUILDING

231 West 54th Street, New York City

Address A. L. KULL, Gen. Mgr.

Telephone, Columbus 4954-4955

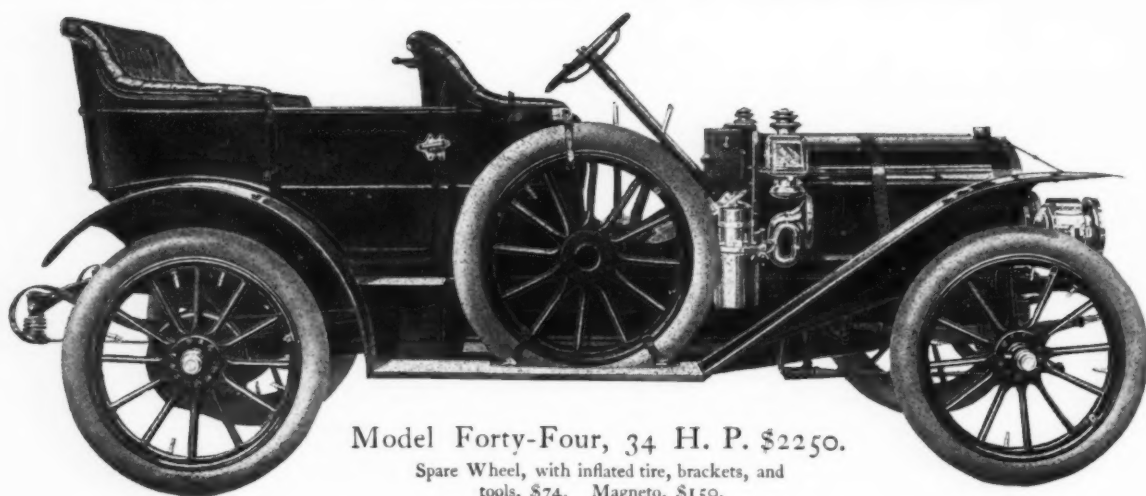
 We will exhibit at the A. M. C. M. A. Show, Grand Central Palace, December 31 to January 7

Touring Car Section



INCLUDING

Light and Standard Designs, in Shaft and
Side-Chain Drives.



Model Forty-Four, 34 H. P. \$2250.

Spare Wheel, with inflated tire, brackets, and tools, \$74. Magneto, \$150.

Rambler

NEW YORK EXHIBIT

Have you seen the Rambler Spare Wheel operated? It can be substituted for the regular wheel within three minutes.

We invite every one who is interested to call at the Rambler show, 38-40 W. 62nd St., and see the demonstrations of this exclusive Rambler feature.

Such exclusive features as the offset crank shaft and straight line drive which have contributed so much to the satisfaction given by the new Ramblers during the past year, will also be explained.

The line now includes some new models never before shown, that will interest dealers in open territory. No other make at anywhere near Rambler prices approaches them in class and exclusive features.

During all New York shows Ramblers will be shown and demonstrated at the new Rambler Branch, 38-40 W. 62nd St., New York. Telephone Columbus 4511; give your address and we will call for you.

Thomas B. Jeffery & Company

Main Office and Factory, Kenosha, Wis.

R
a t
pow
for
to
who
ing
T
han
of
The
ing
to a

In
ing
that
with
the
crea
and
who
are
two
plan
of t
hor
with
ing
hold
one
sam
dian
plac
cert

W
ligh
stru
in a
subj
the
ang
cars
larit
of o
T
in n
old
in q



Some Features of Touring Cars.

FORMERLY it was taken for granted that an automobile seating more than two passengers constituted the essentials of a touring car. No attention was paid to the question of the power plant, the strength of the chassis, or the accommodations for passengers beyond the seating capacity. It was not uncommon to note a single-cylinder motor mounted in a light frame, on wheels of small diameter, with a body for five passengers weighing more than all the rest of the car combined.

The present trend of the industry is in the direction of the harmonious relation of the chassis, power plant, and the line of markation between strictly runabout types and touring cars. The runabout types are highly developed, specialized cars, serving definite ends, and are of sufficient importance to entitle them to a separate discussion.

Light Touring Cars.

Instead of overburdened runabouts, we have to-day light touring cars, differing from the standard touring products only in that they are equipped with motors less powerful and fitted out with bodies to seat five passengers. The light touring cars of the present time are more commodious by far than the imported creations of two or three years ago, masquerading as touring cars and all the rage. These light touring cars, in some cases, have a wheelbase of 110 inches, seat five passengers comfortably, and are superior in every way to anything by way of a touring car of two or three years ago. The relation of the ability of the power plant to the total weight is nicely adjusted in that the motors are of the four-cylinder conventional types rated at from 20 to 30 horsepower, as a rule. The total weight of these cars is well within a gross ton, in the most severe examples, and with increasing weight it is customary to increase the power of the motor, holding in nearly every case to the ratio represented by at least one horsepower to one hundred pounds of total weight. These same light touring cars are provided with wheels of more liberal diameter than were wheels heretofore, and it will not be out of place to state that increasing the diameter of the wheels within certain limits is equal to increasing the power of the motor.

While it is true that the shaft drive is very predominate in light touring cars as they obtain to-day, this is not to be construed as indicating any stricture on the side-chain ability, since in all truth, both methods are well represented in the cars of the subject and both methods are competent. In the cases involving the side-chain drive it is not necessary to take into account the angularity, and a point to be made here is that in the shaft-drive cars of the present time the propeller shaft is long and the angularity of the drive is substantially zero under normal conditions of operation.

The universal joint is in every case protected from dust, and in nearly every case provision is made for lubrication, so that the old strictures in relation to this phase of the type of touring car in question have lost their potency. The machinery in all its de-

tails is open to inspection, and arranged in such a way as to afford ready access in case of the need of road repairs. This phase of the situation is pleasantly unusual, because there was a time in connection with the light car when to get at any of the adjustments was extremely difficult, if not impossible.

The light touring car has taken on the dignity of an individuality all its own; it bears no relation to its old prototype, and is in no sense a runabout, but, broadly speaking, it is a five-passenger touring car of standard characteristics, differing in no wise from the more pretentious touring cars, excepting that it is lighter, has less need of power, hence a smaller motor, and is geared to speed at about two-thirds of the speed of the larger types of touring cars.

Standard Touring Cars.

If the new crop of light touring cars may be regarded as roomy five-passenger cars, weighing less than a gross ton in almost every case, and equipped with motors capable of delivering at least a horsepower per 100 pounds, the standard touring car differs in degrees.

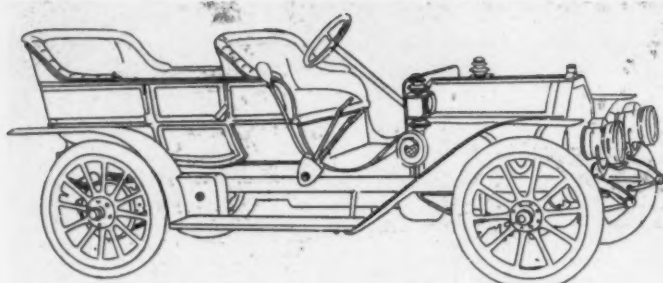
In the standard touring cars seven-passenger bodies of the most roomy description are afforded. The motors are four or six-cylinder types, and the power is on an increased basis, not only because the weights of the cars are greater, but in order to afford a greater ratio of power per hundred weight than the power available in the light touring cars. Obviously, then, the big cars (so-called) go faster, carry seven passengers instead of five, negotiate more difficult roads, because they have more power, wheels of greater diameter, and other parts to match.

In the standard touring cars, the price being considerably higher, there are essential differences which cannot be seen on the surface. Since the motors deliver more power, and since the resistance is greater at every point, the materials must be either initially of greater ability, or the heat treatment to which they may be subjected must be more nearly in accord with the arduousness of the service such cars would necessarily be expected to thrive in.

It is perfectly apparent that to increase the size and the weight of the car, and to increase the motor as respects its horsepower ability in mere direct proportion, would result in a heavier car with a falling off in the speed because the increased weight would sink the tires deeper into the road bed and the road resistance would demand more power for a given speed.

Wheels of Greater Diameter.

Prior to the introduction of the drop frame there was an attempt to placate the ideas of patrons who were quick to see the advantages of a low center of gravity. This attempt took shape by way of a reduction in the diameters of the tires used (diameter of the wheels). The cars looked low, but the center of gravity was about the same as it would have been were the wheels



Characteristic Chain Drive Standard Touring Car.

of greater diameter, all other things remaining constant.

In the modern touring cars the drop-frame idea has rendered it feasible to use wheels of suitable diameter without having to use deception with a view to making the center of gravity look lower than it really is. The standard touring cars of the present time, then, are comparatively low in this respect, notwithstanding the fact that they are more commodious than were cars at any previous time.

The Length of the Wheelbase.

For the standard touring cars in which the motors are of great power, hence of some length, in which a seven-passenger body takes the place of five, the wheelbase distance is, naturally, considerably more than would obtain with the light touring car. In the standard car, then, the wheelbase distance ranges between 110 and 140 inches. The lower dimension would scarcely accommodate more than a five-passenger space, whereas the higher dimensions given take into account seven passengers.

Systems of Control.

If brakes and other means of control are important in cars in general, they are of the utmost importance in touring cars. Touring cars have a wide radius of action, must negotiate country roads of indifferent or even bad construction, and frequently the roads are passed over in the night time under conditions of fog or rain. It is plain to be seen that the brakes must be easy to manipulate and positive in their action. It is equally plain that the new cars more nearly satisfy the exacting demands than they have been satisfied before. The brakes are with larger drums, wider faces, more nearly indestructible linings, and lever systems, laid out to actually accomplish the task imposed upon them.

In the past it was not uncommon to have the speed-changing levers stick on small provocation. This matter has been afforded painstaking care in pretty much all of the line of cars to be seen to-day, probably because all designers realize the necessity of smooth action in speed-changing levers. It is not now possible to find a car in which two separate speed-changing gears could be meshed simultaneously. Fortunately, there never were many cars so imperfect in point of design as to include this defect. One more point, close enough to this phase of the subject to warrant mention, lies in the care with which designers of the present cars have prevented the accidental meshing of the reverse pinion under a misapprehension that a forward speed was being engaged. True, the reverse pinion would refuse its mate, excepting at coincident speeds, or nearly so. A wrecked transmission gear-set is pretty nearly sure to follow the accidental engagement of the reverse gear when the car is driving ahead at even a fairly low speed. Again, in the old days, to motor in costumes of any value was to depreciate the value of the costumes, if grease, grime, or oil would accomplish such destruction. As it is now, the oiling is done by a suitable force-feed oil pump, remote from the space reserved for the occupants of the cars. Under such conditions it is possible to keep the seats, decks and entrances clean.

Some Potential Factors for Safety.

Standard touring cars are essentially capable of speeding; and to speed with safety is a matter of first importance. The modern production requires greater measures for safety because of the greater power of motors used and the increased efficiency of the

transmission, thus ending in a greater maximum speed, with a given weight of car and a given expenditure for gasoline. The effect on the parts of a motor is greater for speed than it is for weight (tires excepted). Since cars are lighter to-day than they were before, better materials and superior designs are necessary to insure safety. To assure safety, the vitals of the new cars are properly nested behind less essential heavy parts. The steering linkages, for illustration, will be found above and to the rear of the axles, or in equally protected locations. This is in considerable contrast with some of the cars of ancient vintage in which the steering (drag rod) was the lowest down, and the parts which, if they intercepted an obstruction, would result in the greatest damage.

Designers have taken advantage of experience, and while they have evolved cars with a greater ground clearance, they have at the same time lowered the center of gravity. This means that the parts are closely nested and situated at a near approach to the ground clearance line. This is true in almost every case, whereas a year or two ago there were (only) possible exceptions in favor of a high clearance and a low center of gravity.

Features Indicating Increased Comfort.

The standard touring cars, besides affording luxurious space, are upholstered in a manner befitting the service to be rendered. The cars are heavy enough to maintain a level platform, in view of the improvements wrought in spring suspensions; with such a balance of the relation of the weight of the bodies to the weight of the passengers that the absence of one or more passengers will not seriously affect the easy riding qualities, once a pronounced disadvantage in automobiles.

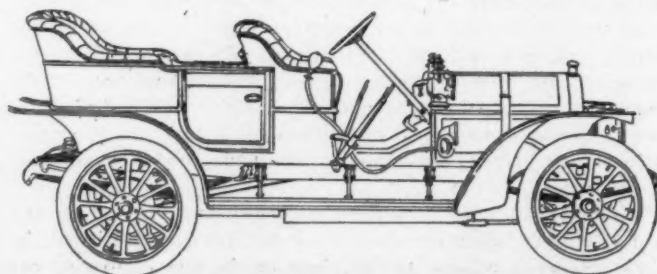
The various noises previously regarded as the most serious drawbacks to cars in touring service are now conspicuous for their absence, not alone as respects the exhaust, but in connection with the linkages and other parts.

Some Special Features.

In touring the question of what to do with the chauffeur, were the owner to drive his own car, as most owners would like to do from time to time, has been very definitely settled by what is now known as the close-couple body. This provides a seat over the rear axle for the chauffeur at all times when he is not actually at the wheel. In his comfortable berth to the rear of the body proper he can neither be seen, nor can he hear what the occupants of the car may be talking about.

The close-couple body brings the side entrance so far in front of the rear wheel as to permit the use of a very wide opening. The shaft drive, if considered in this connection, disposes of the sprocket-wheel housing that always did seem to be in the way. Up to very recently the shaft drive was not regarded as sufficiently rugged to withstand the severe usages incidental to touring. This year's cars would seem to indicate that the shaft drive is not limited by any such considerations at all.

There are numerous other examples in which the side-entrance is quite up to the requirements from the best point of view. Looking at the whole question from any angle, it is to observe a very decided display of ingenuity, the purport of which is to afford to the patrons of the industry the conveniences they express a preference for without in any way defeating the ends from the point of view of necessity, allowing that the design demands cannot well be compromised, even to afford comfort.



Characteristic Shaft Drive Light Touring Car.

The 1909 ROYAL TOURIST

Speedier, longer, roomier, stronger, easier riding and more readily accessible, the Model "M" is without doubt the most permanent car in every particular that has yet been presented to the motor world.



The Model "M"

NEW FEATURES

MOTOR

Chief of the new improvements is the motor, with a larger bore and stroke, the new dimensions being 5½ inches by 6 inches, giving greatly increased power and a range of from 5 miles to 65 miles on high gear. The enlarged motor demonstrates the acme of excellence to be obtained in smooth running and reliability.

CARBURETER

An improved carbureter, actually unique as a fuel saver, insures positive service with the minimum of effort and expense.

IGNITION

The improved and independent double ignition system is greatly simplified, does away with much wiring, and is a distinct advance over any system heretofore devised.

LUBRICATION

Two separate force feed oiling devices of increased capacity and efficiency are incorporated.

TRANSMISSION

The selective type of transmission, giving four forward speeds and one reverse, is employed.

BRAKES

Five distinct brakes give perfect security to the Royal Tourist user.

AXELS

The front axle is of I-beam construction and the rear is of the readily demountable floating type.

WHEEL-BASE AND TONNEAU

A considerably lengthened wheel base—the new model being 126 inches—an extra roomy tonneau, accommodating six persons, and luxurious appointments throughout, are features of the Model "M" which will commend themselves to the discriminating.

ACCESSIBILITY

Every innovation, every change and every improvement has been so made as to render it possible to easily remove any part without disarranging any other part.

Nothing has been omitted and everything has been done to make the new Royal Tourist the most dependable car on the American market for years to come.

The Royal Tourist Car Company, Cleveland, Ohio

THE TEST OF SERVICE IS ALL WE DEMAND

MEMBERS OF A. L. A. M.



**CHADWICK STOCK
RUNABOUT,
STRIPPED FOR
RACING**

New Models, to be known as the

"PERFECTED"

GREAT CHADWICK SIXES

will be shown for the first time
at the
Grand Central Palace Show, New York

We have abandoned yearly models and standardize The "Perfect Car" which will be exhibited in Touring Car, Tourabout, Runabout and Chassis.

The above illustration is of the victorious test car.

This car made its initial appearance in the Wilkes-Barre Hill-Climb, May 30th, 1908, at which time it shattered all records. Since that time it has won all the big hill-climbs of 1908 in which it was entered, and would easily have won the Vanderbilt Cup Race had it not been for a crippled magneto in the seventh lap. Thus we have tried and tested the new perfected models, exact duplicates of which with the various bodies are being initially exhibited.

IMPROVEMENTS

Note the following improvements in the "Perfect Car" **Great Chadwick Sixes** initially exhibited at Grand Central palace, New York

WHEEL BASE—Seven-passenger Touring Car and Tourabout, 130"; Racing Runabout type, 112".

BRAKES—Four very large and improved brakes, equipped with air-cooled shoes 1 1/4" in thickness, instantly adjustable.

CLUTCH—Improved internal expanding type. The band can be entirely removed for inspection in 30 seconds.

DRIVE—The only ABSOLUTELY SILENT chain drive in existence—sprockets and chrome nickel steel chains are so constructed and contained in oil-tight cases that chain noise is completely eliminated in the new model.

MAGNETO—Improved Bosch high tension, equipped with perfected advance device, which insures easy starting on quarter turn without use of the battery system.

HORSE-POWER—An absolute increase of 35 per cent in power; this great increase is obtained by refinements and improvements, while the bore of 5" and stroke of 6" remains the same as in 1908 model.

LUBRICATOR—Improved; the flexible shaft has been replaced with a direct shaft drive.

COOLING—A most efficient type of Honey-Comb Radiator is used in place of the cellular type.

TIMING—Hardened chrome nickel-steel time gears, cam shaft and cams accurately ground by special grinding machines, valve lifts readily adjustable.

SPRINGS—Exhaustive tests of the improved suspension have demonstrated greatly increased resiliency and stability.

STEERING GEAR—New Chadwick system of gear, instantly adjustable with large heavy steering post and 19" wheel. The new steering device is made of chrome nickel steel throughout. The band sectors on wheel controlling the gas and spark are of a new and perfected type.

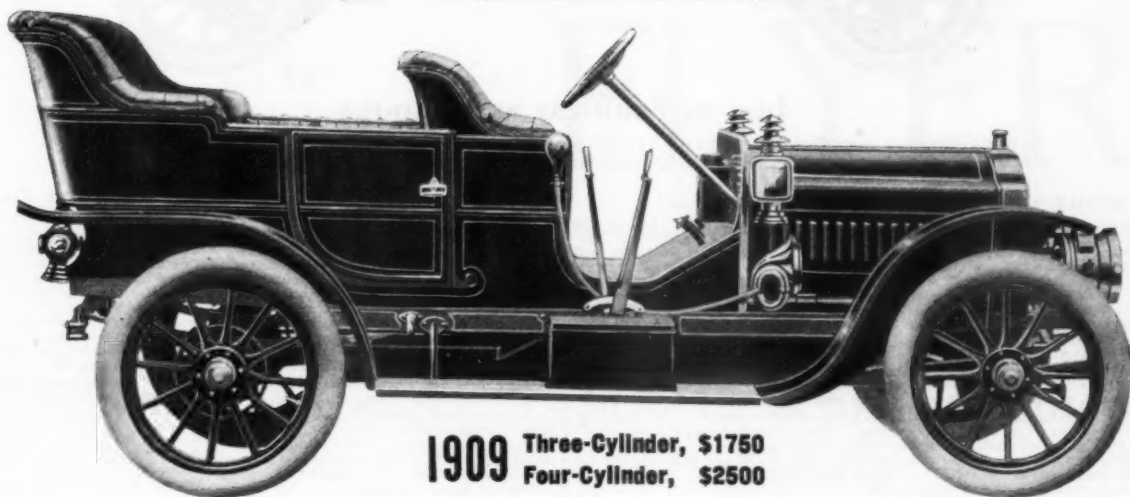
CONTROL—The gear shift lever, segment and locking device are much heavier and the design is improved. The emergency brake lever is also heavier while clutch, foot brake and foot accelerator are all adjustable for position and refined in appearance.

BODIES—The bodies are much larger, while the workmanship and material are the very best that careful attention and unrestricted expenditure can obtain.

Apply for literature and address communications to Department S

CHADWICK ENGINEERING WORKS
POTTSTOWN, PA., U. S. A.

Your Purchase of Any Four-Cycle Car Is Your Perpetual, Unbreakable Contract with Troubles—Troubles Entirely Unknown to the Elmore Owner



1909 Three-Cylinder, \$1750
Four-Cylinder, \$2500

Right now you are most likely considering the purchase of some four-cycle car.

The question that vexes most is whether it shall be one with a four-cylinder or a six-cylinder engine.

But that which seems so important to you shrivels to insignificance before the greater question of four-cycle or two-cycle.

For on the latter—entirely on the latter—depends your future satisfaction with the car you buy.

Yes, the very life of the car itself is prematurely shortened, or prolonged, by the principle of its motor—four-cycle or two-cycle.

If you understood the Elmore valveless two-cycle car, there could be no question in your mind. Your decision in favor of the Elmore would be a foregone conclusion.

You would know why the Elmore runs and runs and



runs, with never a bit of unnecessary trouble or exasperation or expense—just as every present Elmore owner knows.

You would realize what you don't know now—how all-powerful is the influence of valves.

The Elmore engine has no valves; it produces the smooth, constant rhythm of power known as continuous torque—something that no four-cycle engine, no matter how many cylinders it has, can do.

These differences are comprehensively explained in the 1909 literature. Get it and study it until you are perfectly familiar with the Elmore valveless two-cycle engine.

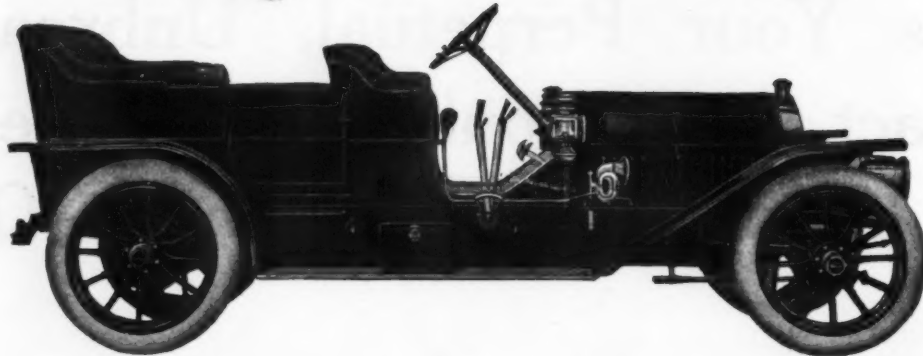
Then seek the Elmore dealer and a demonstration of the car. The dealer has been allotted as many cars as he can obtain, so you realize the necessity of deciding without delay.

THE ELMORE MFG. CO., 1304 Amanda Street, Clyde, O.

Member Association of Licensed Automobile Manufacturers

THE ELMORE WILL BE EXHIBITED ONLY AT THE MADISON SQUARE GARDEN SHOW, NEW YORK, JANUARY 16-23. STUDY IT THERE.

National



Just as Faultless as It Looks

The following specifications should appeal to those experienced motorists who appreciate a car of irrefragable character

MODEL 9-35

MOTOR—Four cylinder, $4\frac{1}{2} \times 4\frac{1}{2}$ inches vertical, cast in pairs, mounted on main frame. Mechanical valves, exhaust and admission on opposite sides and interchangeable. Ball-bearing crank shaft and ball-bearing cam shafts. Tapered nipples used on intake, exhaust and water pipes in place of packing. Extra long Parsons white bronze bearings on connecting rods. Gear driven distributor. Divided aluminum crank case. Interchangeable parts.

CLUTCH—Self-contained aluminum cone, leather faced, spring cushioned.

TRANSMISSION—Sliding gear selective type. Three speeds forward and one reverse, direct on high. Self-contained annular type ball-bearings on main and counter shafts. Gears run in oil.

WHEEL BASE—115 inches.

DRIVE—Bevel gears through ball-bearing propeller shaft and flexible joint to rear axle of improved design.

BEARINGS—Annular type ball-bearings throughout.

WHEELS—Wood, artillery pattern, ten $1\frac{1}{2}$ -inch spokes front and twelve rear.

OILING—Crank case, constant level force feed oiler. Oiling all working parts of motor.

IGNITION—Two separate, complete systems. One a gear-driven high-tension Bosch magneto. The other a storage battery, single coil and distributor. Each system has a separate set of spark plugs.

GASOLINE CAPACITY—15 gallons.

TIRES—34 x 4. Diamond, G. & J. or Michelin.

BRAKES—Two systems. Four internal expanding metal to metal hub brakes and two band brakes on outside of rear wheel drums. Hand lever applies one set. Foot push pedal applies the second set.

FRAME—Pressed steel $4\frac{1}{2}$ -inch channel section firmly riveted and braced and curved up over rear axle. No sub-frame.

FRONT AXLE—I-beam, steel forging.

REAR AXLE—Compound construction. Inner axle used only as a driver. Wheels turn upon double annular type ball-bearings on hollow axle which carries all weight.

FINISH—Coach carmine or national red; black stripes.

BODY—Straight line sheet metal, side entrances. Divided front seats. Carrying capacity, 5 passengers.

STEERING SYSTEM—Eighteen-inch hand wheel, inclined post. Worm and gear, non-reversible chuck. Ball joint connections to steering knuckle.

CONTROL—Single lever at driver's right controls all speeds. Three forward and one reverse.

SPRINGS—Half-elliptic; 40-inch front, under frame; 48-inch rear, outside of frame; 37-inch cross on rear.

EQUIPMENT—Two 8-inch Rushmore searchlights with generator; side and tail lamps. Storm aprons, horn and tools.

PRICE—\$2,750.00, F. O. B. Indianapolis.

MODEL 9-40

MOTOR—Four cylinder, 5×5 inches vertical, individually mounted on sub-frame. Mechanical valves, exhaust and admission on opposite sides and interchangeable. Ball-bearing crank shaft and ball-bearing cam shafts. Tapered nipples used on intake, exhaust and water pipes in place of packing. Extra long Parsons white bronze bearings on connecting rods. Gear-driven distributor. Divided aluminum crank case. Interchangeable parts.

CLUTCH—Self-contained, aluminum cone, leather faced, spring cushioned.

TRANSMISSION—Sliding gear selective type. Three speeds forward and one reverse, direct on high. Self-contained annular type D. W. F. ball bearings on main and counter shafts. Gears run in oil.

WHEEL BASE—125 inches.

DRIVE—Bevel gear through ball-bearing propeller shaft and flexible joint in rear axle of improved design.

BEARINGS—Annular type D. W. F. ball bearings throughout.

WHEELS—Wood, artillery pattern, twelve $\frac{1}{2}$ -inch spokes front and rear.

OILING—Crank case, constant level force-feed oiler. Oiling all working parts of motor.

IGNITION—Two separate, complete systems. One gear-driven, high-tension Bosch magneto. The other a storage battery, single coil and distributor. Each system has a separate set of spark plugs.

GASOLINE CAPACITY—17 gallons.

TIRES—36 x $4\frac{1}{2}$. Diamond, G. & J. or Michelin.

BRAKES—Two systems. Four dust proof internal expanding metal to metal hub brakes. Hand lever applies one set. Foot push pedal applies the second set.

FRAME—Pressed steel $4\frac{1}{2}$ -inch channel section—with sub-frame—firmly riveted and braced and curved up over rear axle.

FRONT AXLE—Seamless, cold drawn steel tubing, heavy gauge, forged yokes, or I-beam steel forging.

REAR AXLE—Compound construction. Inner axle used only as a driver. Wheels turn upon double annular type D. W. F. ball bearings on hollow axle which carries all weight.

FINISH—Coach carmine or national red; black stripes.

BODY—Curved line cast or straight line sheet aluminum, side entrances. Divided front seats. Carrying capacity, seven passengers. (Two on folding seats in tonneau.)

STEERING SYSTEM—18-inch hand wheel, inclined post. Worm and gear, non-reversible chuck. Ball joint connections to steering knuckle.

CONTROL—Single lever at driver's right controls all speeds. Three forward and one reverse.

SPRINGS—Half elliptic; 40-inch front, under frame; 50-inch rear, outside of frame; 39-inch cross on rear.

EQUIPMENT—Two 9-inch Rushmore searchlights with generator; side and tail lamps. Storm aprons, horn and tools.

PRICE—\$3,700.00, F. O. B. Indianapolis.

MODEL 9-50

MOTOR—Six cylinder, $4\frac{1}{2} \times 4\frac{1}{2}$ inches vertical, in pairs, mounted on sub-frame. Mechanical valves, exhaust and admission on opposite sides and interchangeable. Ball-bearing crank shaft and ball-bearing cam shafts. Tapered nipples used on intake, exhaust and water pipes in place of packing. Extra long Parsons white bronze bearings on connecting rods. Gear-driven distributor. Divided aluminum crank case. Interchangeable parts.

CLUTCH—Self-contained, aluminum cone, leather faced, spring cushioned.

TRANSMISSION—Sliding gear selective type. Three speeds forward and one reverse, direct on high. Self-contained annular type D. W. F. ball bearings on main and counter shafts. Gears run in oil.

WHEEL BASE—130 inches.

DRIVE—Bevel gear through ball-bearing propeller shaft and flexible joint to rear axle of improved design.

IGNITION—Two separate, complete systems. One a gear-driven high-tension Bosch magneto. The other a storage battery, single coil and distributor. Each system has a separate set of spark plugs.

OILING—Crank case, constant level force-feed oiler, oiling all working parts of motor.

GASOLINE CAPACITY—17 gallons.

WHEELS—Wood, artillery pattern, twelve $1\frac{1}{2}$ -inch spokes front and rear.

TIRES—36 x $4\frac{1}{2}$. Diamond, G. & J. or Michelin.

BRAKES—Two systems. Four dust proof internal expanding metal to metal hub brakes. Hand lever applies one set. Foot push pedal applies the second set.

FRAME—Pressed steel $4\frac{1}{2}$ -inch channel section—with sub-frame—firmly riveted and braced and curved up over rear axle.

FRONT AXLE—Seamless, cold drawn steel tubing, heavy gauge, forged yokes, or I-beam steel forging.

REAR AXLE—Compound construction. Inner axle used only as a driver. Wheels turn upon double annular type D. W. F. ball-bearings on hollow axle which carries all weight.

BODY—Curved line cast or straight line sheet aluminum side entrances. Divided front seats. Carrying capacity, seven passengers. (Two on folding seats in tonneau.)

FINISH—Coach carmine or national red; black stripes.

BEARINGS—Annular type D. W. F. ball-bearings throughout.

STEERING SYSTEM—18-inch hand wheel, inclined post. Worm and gear, non-reversible chuck. Ball joint connections to steering knuckle.

CONTROL—Single lever at driver's right controls all speeds. Three forward and one reverse.

SPRINGS—Half-elliptic; 40-inch front, under frame; 50-inch rear, outside of frame 39-inch cross on rear.

EQUIPMENT—Two 9-inch Rushmore searchlights with generator; side and tail lamps. Storm aprons, horn and tools.

PRICE—\$4,200.00, F. O. B. Indianapolis.

MODEL 9-60

MOTOR—Six cylinder, 5×5 inches, vertical, individually mounted on sub-frame. Mechanical valves, exhaust and admission on opposite sides and interchangeable. Ball-bearing crank shaft and ball-bearing cam shafts. Tapered nipples used on intake, exhaust and water pipes in place of packing. Extra long Parsons white bronze bearings on connecting rods. Gear driven distributor. Divided aluminum crank case. Interchangeable parts.

CLUTCH—Self-contained aluminum cone, leather faced, spring cushioned.

TRANSMISSION—Sliding gear selective type. Three speeds forward and one reverse, direct on high. Self-contained annular type D. W. F. ball-bearings on main and counter shafts. Gears run in oil.

WHEEL BASE—137 inches.

DRIVE—Bevel gear through ball-bearing propeller shaft and flexible joint to rear axle of improved design.

BEARINGS—Annular type D. W. F. ball-bearings throughout.

WHEELS—Wood, artillery pattern, twelve $1\frac{1}{2}$ -inch spokes front and rear.

OILING—Crank case, constant level force feed oiler, oiling all working parts of motor.

IGNITION—Two separate, complete systems. One a gear driven high tension Bosch magneto. The other a storage battery, single coil and distributor. Each system has a separate set of spark plugs.

GASOLINE CAPACITY—20 gallons.

TIRES—36 x 5. Diamond, G. & J. or Michelin.

BRAKES—Two systems. Four dust proof internal expanding metal to metal hub brakes. Hand lever applies one set. Foot push pedal applies second set.

FRAME—Pressed steel, 5-inch channel section—with sub-frame—firmly riveted and braced and curved up over rear axle.

FRONT AXLE—Seamless, cold drawn steel tubing, extra heavy gauge, forged yokes—or I-beam steel forging.

REAR AXLE—Compound construction. Inner axle used only as a driver. Wheels turn upon double annular type D. W. F. ball-bearings on hollow axle which carries all weight.

BODY—Curved line cast aluminum, side entrances, removable tonneau, platform type. Divided front seats. Carrying capacity, seven passengers (five carried in tonneau).

FINISH—Coach carmine or national red; black stripes.

STEERING SYSTEM—18-inch hand wheel, inclined post. Worm and gear, non-reversible chuck. Ball joint connections to steering knuckle.

CONTROL—Single lever at driver's right controls all speeds. Three forward and one reverse.

SPRINGS—Half-elliptic; 44-inch front, under frame; 56-inch rear, outside frame; 39-inch cross on rear.

EQUIPMENT—Two 9-inch Rushmore searchlights with generator; side and tail lamps. Storm aprons, horn and tools.

PRICE—\$5,000.00, F. O. B. Indianapolis.

NATIONAL MOTOR VEHICLE COMPANY, 1000 East 22d Street, INDIANAPOLIS, IND.

Standard Manufacturers A. M. C. M. A.

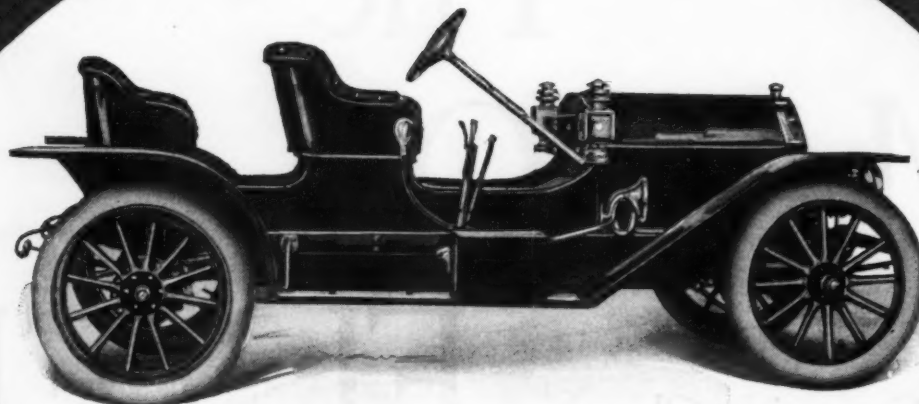
The MARION (The Car with Class) FLYER

1 H. P. to every 52 lbs. of actual weight.

Detachable Toy Tonneau or 5-Passenger
Touring Car, \$1850.00.

We Shall Exhibit at Grand Central Palace
December 31 to January 7.

Marion Motor Car Sales Co.
Indianapolis, Indiana



The Inter-State, Model 28
\$1,750.00

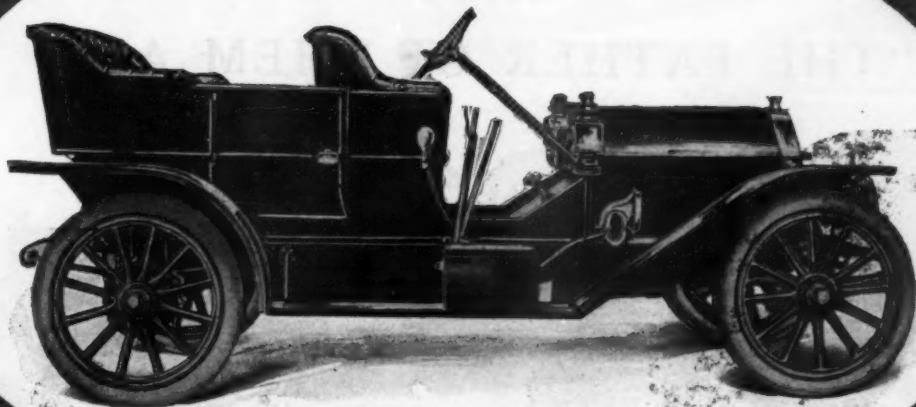
The Inter-State

THE INTER-STATE AUTOMOBILE is built for the intelligent purchaser who wants the high quality which heretofore has been found **only** in **high-priced** cars, but who does not want to pay from twenty-five hundred to five thousand dollars.

The Inter-State makes it unnecessary for such purchasers to pay such prices. It is a **permanent** car, embracing every essential factor of worth in automobile design, style, comfort, speed, endurance, dependable materials and workmanship. And it is sold at a price—\$1750 complete, including Eisemann Magneto—but little higher than the cheap good-enough-until-later cars.

There is no economy and most assuredly no automobile satisfaction in buying a car that you will want to discard the second season for a **real** car. Especially since you can buy the **real** car, the **satisfying, permanent** car this season for just a little more money than a temporary car.

In justice to your own best interests, let us urge you not to **think** of spending your money for a "cheap" car, or even a higher-priced good car, until you have seen the Inter-State. We are glad to let you be the sole judge as to its worth at \$1750.



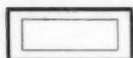
The Inter-State Touring Car, Model 25
\$1,750 00



DEALERS AND AGENTS will appreciate the opportunities opened to them by the Inter-State. Write for our attractive proposition.



At the Shows



The full line of Inter-State automobiles, including Standard Touring Car, Demi-Tonneau, Double Rumble Roadster, Single Rumble Roadster and Tourabout, will be exhibited at Grand Central Palace, New York, December 31-January 7, and at the Coliseum, Chicago February 6-13.

INTER-STATE AUTOMOBILE CO.

127 Willard Street, MUNCIE, INDIANA

SPECIFICATIONS:

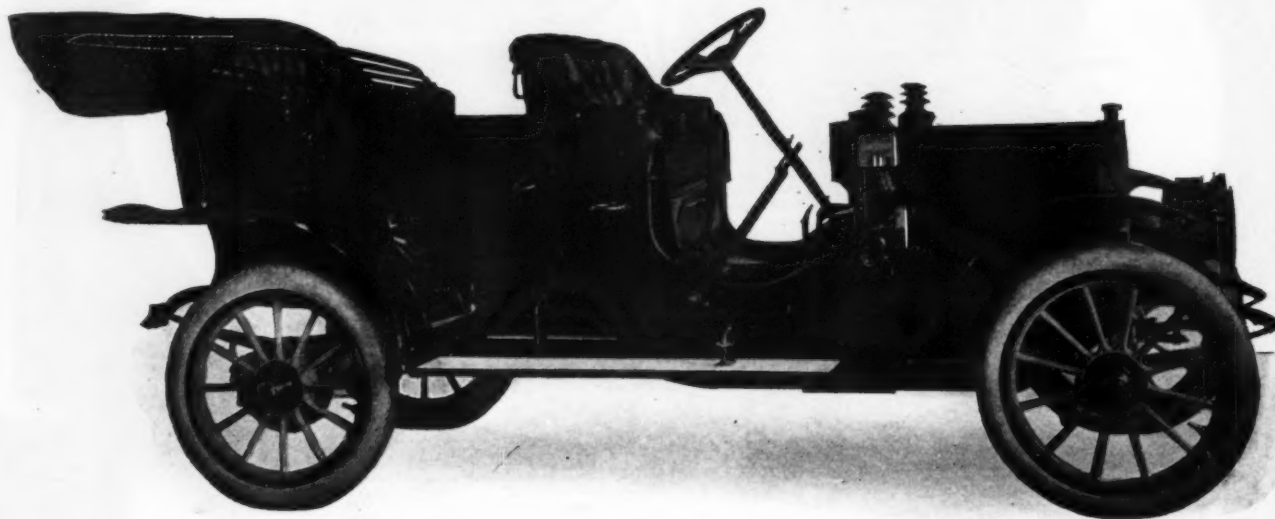
Frame—Pressed from cold rolled steel, special stock.
Front Axle—"I" beam, drop forged in one piece—not welded—and double heat treated.
Rear Axle—The reliable semi-floating type with large axle shafts and Hyatt Roller Bearings.
Wheels—Artillery type, 12 spokes, 1 $\frac{3}{4}$ -in., 34-in. diameter.
Tires—Standard Goodyear Quick Detachable, Continental or Diamond, 34x4 inches.
Brakes—Four 12-in. brakes all acting on rear hubs, external and internal.
Transmission—Three speed selective type and reverse, with vanadium steel gears. The selective mechanism built inside transmission case, thoroughly lubricated at all times.
Gear Ratio—3 $\frac{1}{2}$ to 1, giving from 5 to 60 miles on high gear.

Horsepower—35 to 40
Motor—Four-cylinder, 4 $\frac{1}{4}$ x5, water-cooled, cylinders cast in pairs.
Crank Shaft—Special drop forging 35 to 40 carbon steel, double heat treated.
Ignition—Double system Eisemann Magneto, commutator, battery and quadruple coil.
Body Styles—Touring Car, Double Rumble Roadster, Single Rumble Roadster, Tourabout and Demi-Tonneau.
Wheel Base—112 inches.
Tread—56 $\frac{1}{4}$ inches.
Color—Standard Inter-State red.
Price—With best of equipments, head lights and generator, side oil lamps, tail lamp, tube horn, tire repair kit and tools—Eisemann Magneto—F.O.B. Muncie, \$1,750

THE SELDEN CAR

MADE BY

"THE FATHER OF THEM ALL"



ONE PRICE, \$2000—F. O. B. ROCHESTER

TOURING CAR—ROADSTER—TOY TONNEAU

A genuinely good car cannot be made and sold for less than \$2000. By this we mean a car like the Selden, containing nothing but the best of materials, workmanship and finish. A car that the manufacturer can stand behind and guarantee for at least a year against any imperfections in workmanship or material.

We buy only the best materials, employ only skilled labor, and pay particular attention to details and finish, thereby producing a strictly high-grade car at the lowest possible price.

The up-keep and maintenance of a medium-priced car like the Selden is within the reach of any man of moderate means and the value of the car does not depreciate like that of the lower priced cars. This is the point to be considered by every purchaser.

The Selden Car is a 4 cylinder, 28-30 H. P. (developing 37 H. P.) five-passenger Touring Car, or three-passenger Roadster, with 114 inch wheel base, 34 inch wheels, shaft drive, selective control, pressed steel frame, metal body, fully equipped.

Superb riding, roomy tonneau, luxurious upholstery, smooth running, great hill-climber, flexible and easily handled, economical in maintenance and up-keep, fine finish, stylish and attractive.

THE COMING CAR OF MODERATE PRICE

Catalog and Agency Proposition Upon Request

Agencies Wanted Everywhere

We will Exhibit at Madison Square Garden Show

SELDEN MOTOR VEHICLE CO., ROCHESTER, N. Y.

GEORGE B. SELDEN, President

Members Association of Licensed Automobile Manufacturers



Automobile and Service. Make sure that you pay for nothing else but this. Check over every car offered you point by point.

You can pay \$2500 for a four-cylinder 40-horsepower car, if you want to, but it isn't necessary. You can even go higher, but every dollar you add over the \$1600 you pay for Oakland four-cylinder Forty is just so much money wasted. You get not one cent extra value in either service or appearance.

Consider the matter from the common-sense standpoint.

There are five items you want to be sure of in the car you own. Here they are:

1. Ample power—that's for speed and hill-climbing.
2. Ease of handling and operation. You want a car that you can enjoy riding in.
3. Low cost of maintenance. What it costs to run a car is just as important as what it costs to buy one.
4. Style and finish—a car that will be a credit to you when you drive in it—a car for you and your best friends.
5. Simplicity of construction—so that you can master and understand every detail.

The Oakland "Forty"

40 H.P. Touring Car.....\$1600
40 H.P. Runabout..... 1600

When you see this big car, and ride in it, it will be hard for you to understand why we do not add at least \$500 to its price.

The Oakland "Forty" has a 112-inch wheel base, weight, 2100 lbs., shaft drive, four-cylinder motor, cylinders cast in pairs, 1-2-inch bore by 5-inch stroke, making a power plant that we could rate higher than 40 h.p. if we were inclined to follow the practice obtaining with many makers. It is sufficient to say that no matter how much you "let her out" you will always find the Oakland "Forty" has just a little more reserve power ready for emergency. 34 x 4 tires, front and rear. Cooling is by centrifugal pump and vertical tube radiator. Brake external and internal, acting direct on rear wheels. Transmission is of the selective sliding gear type, three speeds forward and reverse. Steel I-beam front axle. Price includes three oil lamps, two large headlights, horn and complete tool kit.

Its flexibility of control, its quiet, steady transmission, and its remarkable roadability make it the one biggest \$1600 worth of automobile you can buy to-day.

Now the Oakland cars (this is true of both the "Twenty" and the "Forty") were not built to meet a preconceived price.

We have other ideals beyond producing the cheapest car on the market.

We designed and built the Oakland car up to a standard that would not admit of the slightest compromise—and then set the price.

The fact that we were able to produce a car that in every respect met the demand of a high-grade family car at a sensationally low price, is just an incident—but a mighty satisfactory one—to the man who wants to get the best car in the country for his money.

So we say again, check over these points before you select your car.

The Oakland "Twenty"

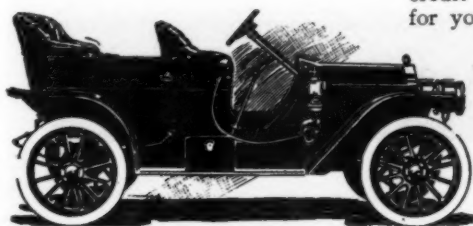
20 H.P. Touring Car or Roadster.....\$1250
20 H.P. Runabout..... 1200

A comfortable, roomy family car, equipped with the unique Oakland two-cylinder vertical motor, 1-2-inch bore by 5-inch stroke. Don't confuse this with motors of the double opposed type. It is entirely different and altogether superior, and as they are equipped with an extremely ingenious counter-balancing device, they run with all the smoothness and absence of vibration formerly thought possible only with the four-cylinder motor.

In fact, anyone taking their first ride in an Oakland "Twenty" finds it hard to believe that it is not a four-cylinder motor under the hood, so noiselessly and smoothly does it run.

The "Twenty" has 100-inch wheel base. Weight, 1700 pounds. Shaft drive, 32 x 3 1-2 front and rear tires. Thermo-syphon system of cooling with fan in fly-wheel, vertical tube radiator. Brakes external and internal, operating on drums of rear wheels. Transmission of a superior planetary type, two speeds forward and reverse without a single adjustment ever necessary or possible. Price includes three oil lamps, two headlights, horn and complete tool kit.

You must see an Oakland and ride in it to appreciate the perfect result of Oakland design and Oakland skill in construction. Write for the name of our nearest dealer who will, by actual demonstration, make its superiority clear to you.



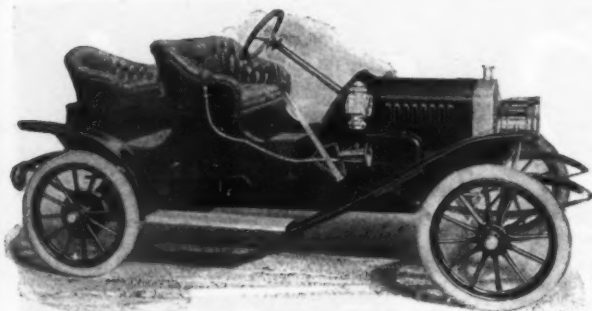
Oakland "Twenty" 2 cylinders vertical
20 horsepower, \$1250.

Oakland Motor Car Co.

204 Oakland Avenue
PONTIAC, MICH.

Standard Mfrs. A. M. C. M. A.

We exhibit in New York only at Grand
Central Palace Auto Show, opening
Dec. 31, and at Chicago Feb. 6 to 13



Model A-1. \$800

Specifications

Model A-1.—Will accommodate three passengers; rumble seat; 30"x3" tires; 18 H. P.; speed, 1-35 miles; single chain drive, enclosed; weight, 1350 lbs.; 2 gas lamps and generator; 2 oil lamps;

tail lamp; 40" flexible tube. Horn and full tool equipment.

Model A-3.—(\$875.00). Carries the same specifications as Model A-1, with the exception that it is equipped with a surrey seat in rear instead of a rumble seat.

LAMBERT FRICTION-DRIVE CARS

Each Model a Leader in Its Class

The Lambert Car is a **good** automobile at a low price—not for one moment to be confused with **cheap** gear-driven cars.

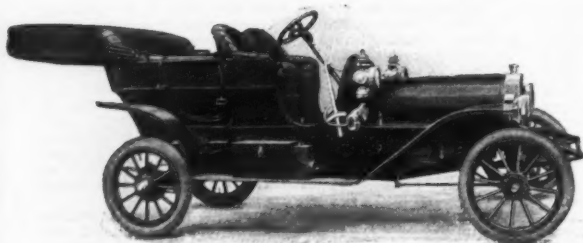
The lower cost of the **more** efficient, simple Lambert friction transmission is what enables us to make a far better car than **any** manufacturer of gear-transmission cars can make for the same money.

In the Lambert Car there's a full dollar's worth of automobile value for every dollar of the price—and more, too, if judged by the ordinary standards.

We say the Lambert friction drive is more efficient than gear transmission. It is. It transmits under all conditions a higher percentage of the power generated than any type of gear transmission. It is the simplest form of transmission. It eliminates gear troubles and gear expense. It gives to the Lambert Car a smooth-running quality found in few cars.

Each Lambert model is distinguished by **other** simplicity, big-value features. Each is a leader in its class.

Buckeye Mfg. Co., Anderson, Ind.



Model 19. \$1750

Specifications

Model 19.—Carries 5 passengers; 117" wheel base; 32"x3½" tires; 4 cylinder Rutenber motor with adjustable fan; 35-40 H. P.; speed, 1-50 miles per hour; single silent chain drive, enclosed; painted Lambert green, striped

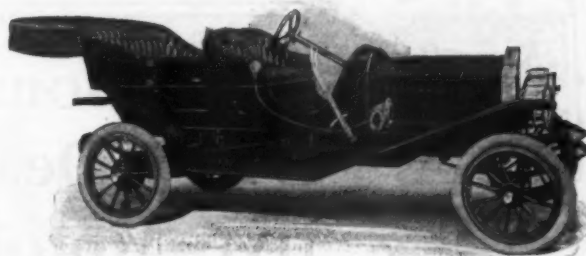
with light green. Special color on proper notice. Weight, 1900 lbs.; 2 large gas lamps with generator; 2 oil lamps; horn; tool box on running board; full tool equipment.

Specifications

LAMBERT "30"—Capacity, 5 passengers; 28 H. P.; 4-cylinder Rutenber motor, with fan attached; speed, 1-45 miles; wheel base, 110½ inches; single silent chain drive, enclosed in dust-tight metal case; tires, 30"x3½" quick detachable pneumatics; detachable tonneau; weight, 1,600 lbs.; body painted deep red, light red stripe on panel, black moulding, running gear light red, striped with Eng-

lish vermillion; special color on proper notice; equipment, 2 gas lamps and generator, tail lamp, 2 oil side lamps, 40-in. flexible tube horn and full tool equipment. Price, \$1250, f.o.b. factory.

The \$1250 Model 27 carries the same specifications as the Lambert 30, except that it is equipped with two bucket seats instead of tonneau.



Lambert "30." \$1250

LAMBERT FRICTION-DRIVE CARS

We Want Lambert Representatives

The demand for automobiles at a low price is unmistakable.

The agent who represents a **good** low-priced car—the Lambert—will get the cream of the business.

Lambert cars, friction driven, have the power, the speed, the endurance, the snappy style, the finish of cars that cost half again as much.

In all territory now unoccupied we want representatives for the Lambert Car. We have an unusually attractive offer to make to the right kind of men who will take up our proposition and look after our interests. We want men who appreciate and will **talk** the Lambert friction drive. Men who know enough about automobiles to recognize the fact that the Lambert Car—each of our six models—is the biggest value on the market at the price.

If you would be interested in taking up the agency question with us, write at once for full details of our proposition. In writing, you will please state what cars you are now handling and your facilities for representing the Lambert. Address **BUCKEYE MANUFACTURING COMPANY, Anderson, Ind.**

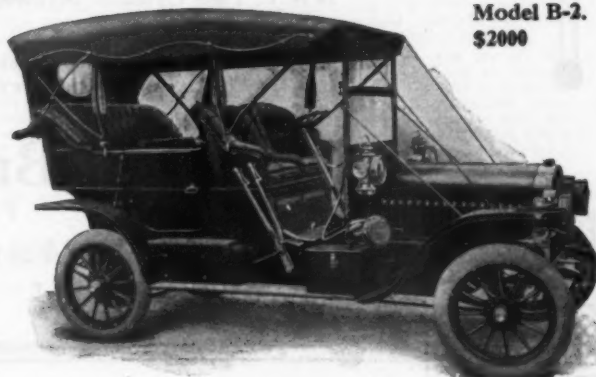
Lambert Cars will be exhibited at the Grand Central Palace Show, December 31 to January

Buckeye Mfg. Co., Anderson, Ind.

Specifications

Model B-2.—Carries 7 passengers; wheel base, 106"; 32"x4" quick detachable tires; 4-cylinder Rutenber motor with adjustable fan attached; 35-40 H. P.; speed, 1-45 miles per hour; direct chain drive to each rear wheel; body imperial green, striped with car-

mine; cape extension; top, with full set storm curtains; glass wind-shield; 2 large gas lamps with generator; oil lamps; tail lamp; horn foot rail; tool boxes on running board and in rear; full tool equipment.

Model B-2.
\$2000



A Personal Invitation to
Every Dealer and Prospective
Motorist at the Grand
Central Palace Show to Visit the
Exhibit of

Simply
Perfect

The
"Maxwell"

Perfectly
Simple

"The Aristocrat of Moderate Priced Cars"

I want you to see the Maxwell at the Grand Central Palace show.

In the making of the Maxwell it has been my belief that we could not afford to use anything but the best materials, because a moderate-priced car, to be as successful as the Maxwell is known to be, must be more durable than the highest-priced cars—because in the very nature of things they receive harder service and less expert attention.

I consider Mr. J. D. Maxwell the foremost automobile designer of the world. Practical to the ex-

treme, Maxwell cars are simple, and because of their simplicity—reliable.

You know the Maxwell principles—principles which have been built in these cars since 1904.

We have issued a magazine; like the foundation of Maxwell success, it is the result of mutual effort. So we call it "The Cooperator." Ask for a copy at the Maxwell booth.

Benj. Briscoe President.

MAXWELL-BRISCOE MOTOR CO.

The Maxwell Principles

Thermo-Syphon Cooling.
Three Point Suspension.

Multiple Disc Clutch.
Unit Construction.

Shaft Drive.
Metal Bodies.

The Maxwell Line—Magneto Equipped

30 H. P. Four Cylinder Touring Car or Roadster.....	\$1750.00
20 H. P. Two Cylinder Touring Car or Roadster, fully equipped.....	\$1450.00 - \$1350.00
14 H. P. Two Cylinder Tourabout, fully equipped.....	\$825.00
10 H. P. Two Cylinder Maxwell Junior.....	\$500.00

Get posted now—ask for a catalogue, or better, arrange
at our Exhibit for a Maxwell demonstration.

Maxwell-Briscoe Motor Co.

P. O. Box 103

Main Office and Factory: TARRYTOWN, N. Y.
PAWTUCKET, R. I. NEW CASTLE, IND.

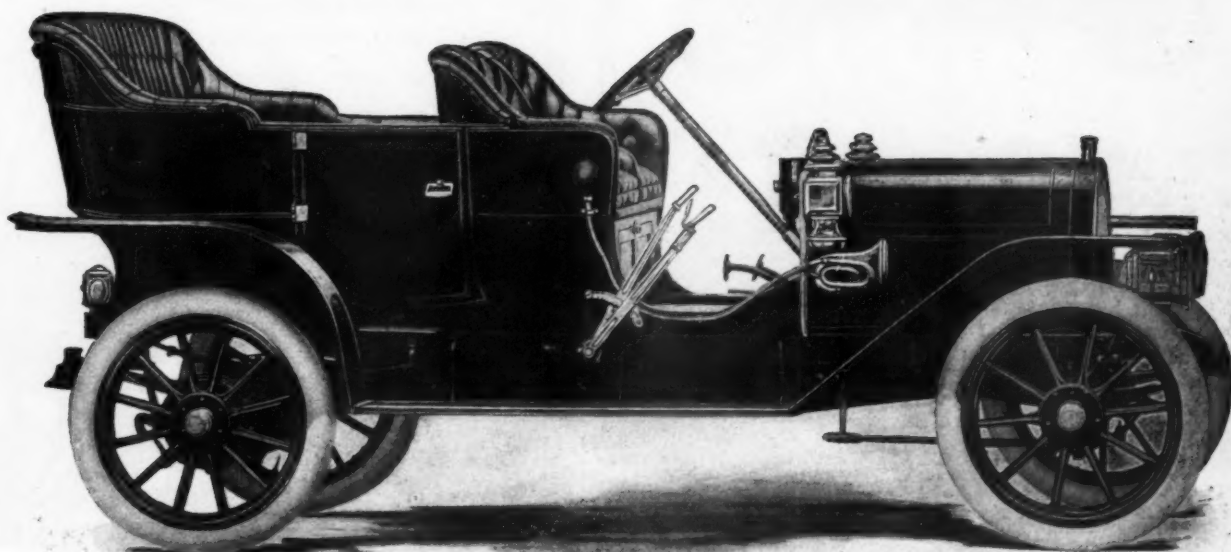


Some conditions which make possible the splendid

Cadillac

"Thirty"

at \$1400⁰⁰



FOUR CYLINDER—30 H. P.—SHAFT DRIVE—SELECTIVE TYPE SLIDING GEAR TRANSMISSION, 106" WHEELBASE.

Ninety-five per cent. of all parts which enter into the construction of the Cadillac Thirty are manufactured in the Cadillac plant.

The Cadillac Company maintains its own brass and iron foundries; its own pattern shops; sheet metal shops; machine shops; gear cutting plants; painting, finishing and upholstering departments.

It makes the magnificent motor and it makes even the little bolts, nuts and cap screws which go into that motor and the car.

It manufactures its own transmissions, its own radiators, its own hoods and its own fenders.

The Cadillac Company operates its own tool making department, in which are made all the special jigs, tools and dies used in the manufacture of the Cadillac Thirty.

Every one of the millions of pieces made each year passes through the hands of a corps of trained inspectors whose watchword is—precision and perfection.

The expenditure for tool maintenance alone in the Cadillac plant in a single year is \$60,000.

So accurately is every part finished that thousands of pieces of a kind with thousands

of pieces of other kinds, are sent to the various assembling departments and there united without so much as the use of the finest file or emery cloth.

There is no occasion for special "fitting." The limits of measurements in many parts of the Cadillac motor, transmission, etc., are specified to the one-thousandth part of an inch.

More than 500 specially designed automatic labor-saving machines which enable one man to do with greater accuracy the work of four or five, or maybe ten, cut a tremendous figure in reducing cost on an output of ten thousand cars.

Two complete and separate mechanical organizations consisting of 3,200 men are working continually night and day on this same output of ten thousand cars.

It has always been admitted that the Cadillac was the most perfectly standardized car in the world—that its interchangeability of parts was practically absolute.

Now the plant that achieves perfect standardization likewise produces the most perfect running car, provided, of course, the motor and other vital parts are competent.

The Cadillac motor bears a reputation without flaw or tarnish. Twenty thousand

Cadillac motors are and have been for four, five and six years operating all over the world, and so far as we know, not one has ever gone out of commission.

The Cadillac Thirty motor is direct heir to all the virtues of the 20,000 other Cadillac motors which have gone before—the most perfect motor the Cadillac plant has ever produced.

Bearing in mind the output of 10,000 cars and the continuous force of 3,200 men and 500 automatic labor-saving machines employed in making them, and the perfect standardization produced by manufacturing all the parts, you will begin to understand why the Cadillac Company is able to build a high grade car to sell at \$1,400—a car which in all probability no other plant in the world could build and sell for less than \$2,500.

The next step is to see the car (it will exceed your highest expectations in dignity, proportion and richness); to ride in it at any reasonable speed up to 50 miles per hour; to examine carefully the engine and the mechanism and then to put it into active road competition with any higher priced car you may choose.

If you will do this our car is installed.

In New York Cadillacs will be exhibited
only at Madison Square Garden, Jan. 16-23,
and in Chicago at the Coliseum, Feb. 6-13.

CADILLAC MOTOR CAR CO.
DETROIT, MICH.

Member A. L. A. M.

Gearless and Olympic Line

FOR 1909

GEARLESS

Model 30-60, 6-cylinder - - \$3250.00

Model 50, 4-cylinder - - 2750.00

Equipped with Gearless Transmission

Model 35, 4-cylinder - - 1500.00
Friction Drive

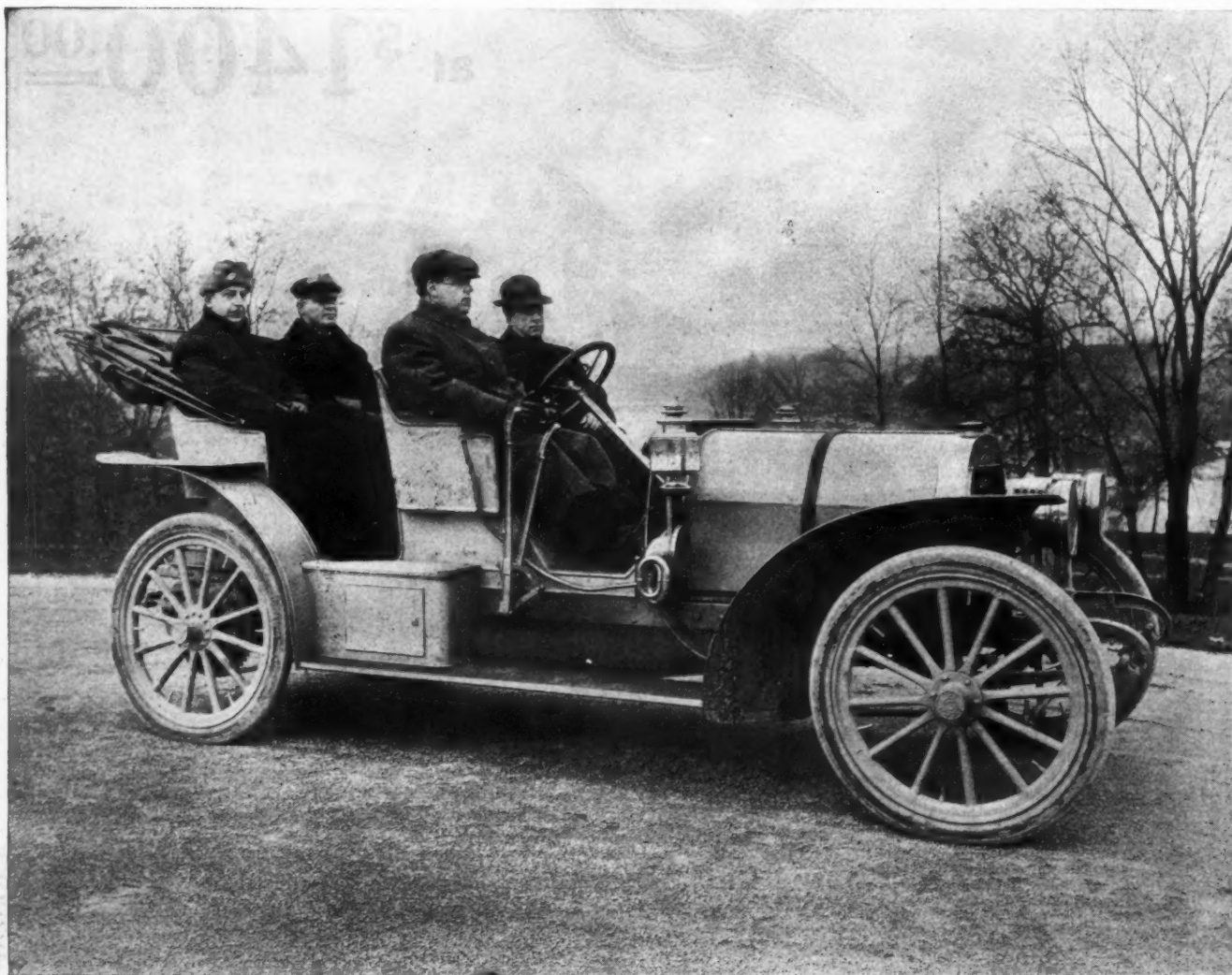
OLYMPIC

Model 30-60, 6-cylinder - - \$3250.00

Model 50, 4-cylinder - - 2750.00

Selective Type Transmission

Model 35, 4-cylinder - - 1650.00
Selective Transmission Axle



GEARLESS 35. 35 H. P.

MOTOR: 4-cyl. $4\frac{1}{2}$ " x $4\frac{1}{2}$ ", Renault type, Water cooled

WHEEL BASE: 119 inches

WHEELS: 36 inches

TIRES: $3\frac{1}{2}$ inches

MAGNETO IGNITION, \$1500.00

AXLES: I-Beam front and rear

IGNITION: Low tension magneto and dry cells

TRANSMISSION: Friction disc operating by spring pressure. Side chain drive.

BODY: 4-passenger roadster, 5-passenger touring

Write for Catalogue

GEARLESS MOTOR CAR CO.

295 PLYMOUTH AVENUE

ROCHESTER, N. Y.

Motoring Satisfaction

with Stearns Cars is Genuine



OUR 30-60 H. P. Model is ideal for those devotees who appreciate abundant reserve power, and a car as nearly perfect as is humanly possible.

Catalog upon request

The F. B. Stearns Co.

Member A. L. A. M.

Cleveland, Ohio

THE THOMAS FLYER

CHAMPION STOCK CAR OF THE WORLD

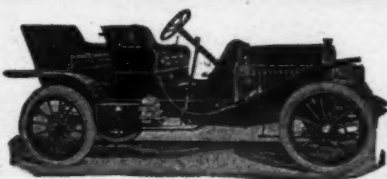
Send 25 cents in stamps to cover cost of mailing and we will send you a beautifully illustrated book on the New York-Paris Race

ADDRESS DEPT. A

E. R. THOMAS MOTOR CO.,
Buffalo, N. Y.

Member A. L. A. M.

Moline "1909"



INVESTIGATE EARLY

The numerous points of merit comprised in the "Moline" Roadster Model "S." We invite comparison, and it will

be a pleasure to show why you can not afford to overlook a car pleasing in appearance, but doubly attractive in ability and low cost of general up-keep.

MOLINE AUTOMOBILE CO. Member A.M.C.M.A. E. MOLINE, Ill.

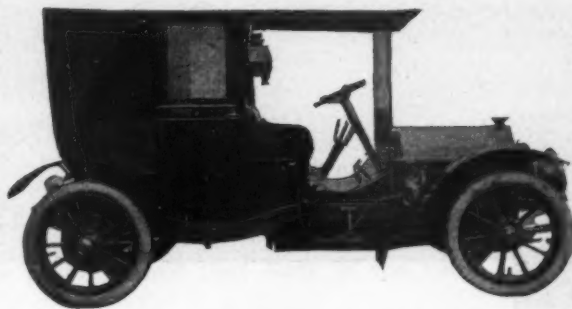
PALMER SINGER

ALL CARS SOLD BY
UNDER SELDEN
GUARANTEED



US ARE LICENSED
PATENT AND
FOR ONE YEAR.

\$3,500



The Palmer-Singer Town and Country Car, 1909 Model, Type XXX-2B, is the most serviceable car on the market to-day. Its 28-30 H. P. motor provides ample power to take its full complement of passengers on long, hard tours over any road at a very good speed. Closed it is a beautiful, luxurious Town Car, seating four inside, ideal for the purpose and far superior to many foreign makes at double the price. A glance at the specifications will show the remarkable value it offers.

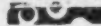
Nickel steel is used to give lightness and strength. Imported F. & S. ball bearings exclusively. Bosch high tension magneto and multiple disc clutches. Drop forged I-beam front axle—four-speed selective type, sliding gear transmission with direct drive on third speed. All brakes equalized, all expanding type and on rear wheels. Universal joints on all steering connections. Shaft driven, all moving parts inclosed in dustproof cases.

Palmer & Singer Mfg. Co.

1620-22-24 Broadway, N. Y. 1321 Michigan Ave., Chicago

Sole Distributors the Simplex

Winner of International 24-hour race at Brighton Beach, October 2d and 3d, and holder of 16 new World's Records.



[Exhibiting at Madison Square Garden.]

THE MARMON

"A Mechanical Masterpiece"



Marmon "Thirty-two," \$2400

An Automobile Classic—A Conspicuous Value

The Marmon "Thirty-two" is neither a cheaply built car at a low price nor a "good enough" car at a high price.

It is a high grade car in every sense of the word, built as carefully as a fine watch. The parts are interchangeable, all of them manufactured by us, rigidly tested and carefully assembled into a harmonious whole.

Weighing not over 2,100 pounds, with 32-40 H. P., this "Thirty-two" has a world of speed and ability. In performance, as in appearance, it is a car that needs no apologies—occasions no regrets—a car you will be proud to own.

The "Thirty-two" sustains the Marmon reputation for mechanical excellence. It can be depended upon to stand up under the most severe usage year after year.

To the man who looks ahead and buys with his eyes wide open, this car is an emphatic bargain. No other car on the market at \$3000 or less offers so much actual value.

Get the specifications, notice the character of design and equipment, and make a few careful comparisons.

Genuine Krupp and Chrome Nickel Steels are used for important parts. Bosch magneto and battery—dual system. Three point motor support. Straight line shaft drive. Rear axle and transmission in one unit. Marmon oiling system. Large brakes. Hess-Bright imported ball bearings. Big tires (34 x 4 all around). Complete equipment. Furnished as Touring Car, Roadster, Suburban, Coupe, or Limousine Town Car.

The Marmon "Fifty," \$3750

A superb car, of most distinguished appearance. In hard, practical cash value, it is the superior of the most famous foreign cars selling at two or three times the price. Furnished with seven-passenger body. 50-60 H. P. Completely equipped.

Marmon "Forty-five" Roadster, a special model, \$3500

The 1909 Marmon models are being exhibited at the Grand Central Palace Show, New York
They will also be exhibited at the Chicago Show, Feb. 6-13

Nordyke & Marmon Co.

Estab. 1851

Indianapolis, Ind.

Standard Mfrs.,
A.M.C.M.A.



Marmon "Fifty," \$3750



The Easiest Riding Car In The World

Pullman '09

ANNOUNCEMENT

WE are ready for 1909 business. As hitherto in years past, the "PULLMAN" cars will maintain leadership as positively the very best automobile value obtainable.

If it is possible to attain perfection, we have reached that state in the 1909 "PULLMAN" cars.

Viewed from any standpoint—as a prospective purchaser or a dealer in motor cars—you can't match the "PULLMAN" quality, the "PULLMAN" prices or the wonderful "PULLMAN" efficiency, design, simplicity of construction, ease of operation, economy of up-keep, durability; in fact, "PULLMANS" are in every feature incomparably superior to any cars yet designed.



Model "K" 30 H.P. Touring Car. $4\frac{1}{2}$ inch bore, $4\frac{1}{2}$ inch stroke.
Price, \$2000.00, including Bosch Magneto.

Every step from the raw material to the finished car in the progress of the making of a "PULLMAN" Automobile is under the eye of an expert in OUR OWN FACTORY and we stand back of the quality, which is the highest standard that can be produced.

In your own interest, don't buy a car, don't accept an agency, until you have full particulars about 1909 "PULLMAN" CARS.

A Model to meet every requirement at the right price. WRITE TO-DAY

York Motor Car Co.

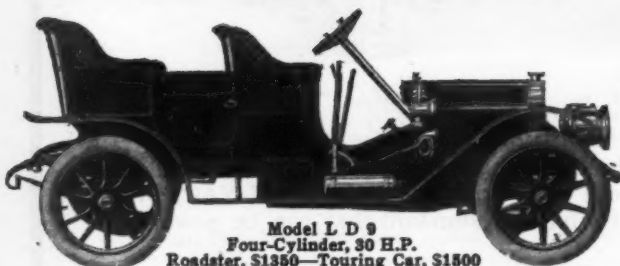
York, Pa

KISSEL KAR

SEE THEM AT
THE
SHOWS

Remy Magneto or
Atwater-Kent Gen-
erator and Dry Cells

A LOW-PRICED
CAR
ALL QUALITY



Model L D 9
Four-Cylinder, 30 H.P.
Roadster, \$1350—Touring Car, \$1500



Model D 9
Four-Cylinder, 40 H.P.
Roadster, \$3000—Touring Car

SEE them at the shows, and if you are going to be open-minded about buying a car it will mean a saving of as much as a thousand dollars. Kissel Kars have the same construction and features as cars costing from \$3000 up—Double ignition, three-quarter elliptic springs, floating type rear axle, I-beam front axle, Timken roller bearings throughout, and two on rear axle instead of one as an extra provision to secure perfect alignment. *Remy magneto with single unit coil, or Atwater-Kent generator and dry cells on Model D 9 and on Model G 9; the 6-cylinder, 60 H. P. \$3000 Kissel Kar, and Remy magneto with single unit coil, and dry cells on Model L D 9.* Model D 9 is a five and seven passenger car, Model L D 9 four or five passenger—that's the only difference. **SEE THESE CARS AT THE SHOWS.**

Write to-day for catalog and name local dealer.

Kissel Motor Car Co. 122 Kissel Avenue Hartford, Wis.



Premier

The direct comparison between American and foreign cars under the same roof at the Grand Central Palace emphasizes the fact that Europe has lost her supremacy.

The Premier stock chassis is generally conceded to represent the highest achievement in motor car engineering.

"The Quality Car"

Send for Catalogue T

Premier Motor Mfg. Co.

Indianapolis, Ind.

R. M. Owen & Co.

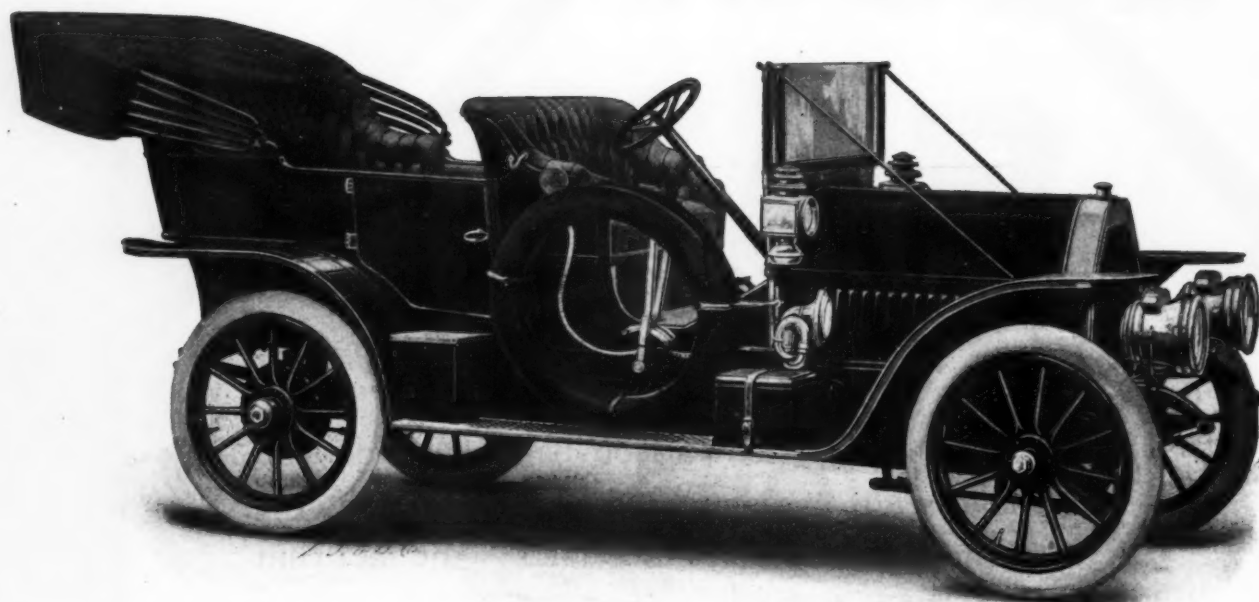
Distributors

East, North and Northwest



The Jewel "40" Touring Car

Price \$3,000 Complete



A Suggestion of Its Completeness

Rutenber Motor, Bosch Magneto, Connecticut Coil and Exide Battery; selective transmission; platform rear suspension; Truffault-Hartford Shock Absorbers; Timken Roller Bearings; 36-inch wheels; Diamond or Goodyear Tires, 4-inch front, 4½-inch rear; full extension top and folding glass wind shield; complete lamp equipment with large Prest-O-Lite Gas tank; trunk rack, extra tire holders, etc.

Sounds a lot for the money and it is a lot for the money. We have pride in our product, which is limited, and practically no overhead expense. We have gotten right down to earth and put together the best car that we know how, with every part of the best material that can be purchased anywhere.

There Isn't Any Guesswork in the Jewel Car

There wouldn't be any guesswork in the mind of any honest agent who aims to give his customers the most he can for the money.

There's a lot of honest agents, too, whose business we can't handle—for, as stated, our output is limited. To the few who speak quick enough, we'll offer an attractive proposition and we'll make good on everything we say. Try us.

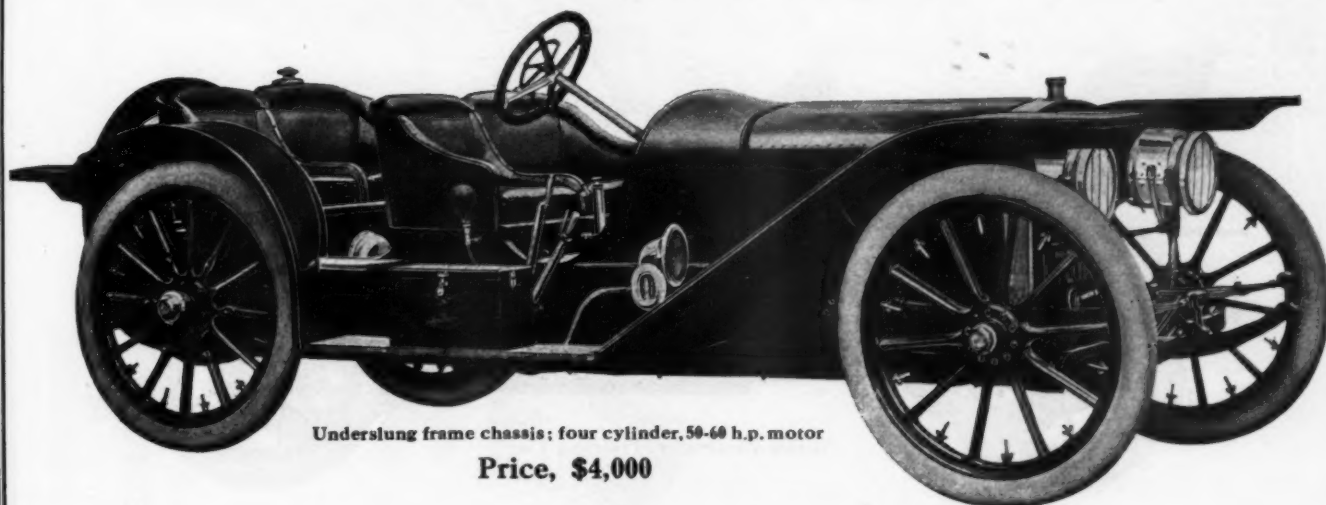
The Jewel Motor Car Company

131 Walnut Street, Massillon, Ohio, U. S. A.

THE AMERICAN

40-inch wheel

TRAVELER



Underslung frame chassis; four cylinder, 50-60 h.p. motor

Price, \$4,000

THIS CAR WILL BE THE SENSATION OF THE SHOW

From this time forward you will hear more, and more, and more of the American.

Heretofore American owners had been mostly men who had formerly driven fine imported cars.

For two years the discriminating few have understood its unique position in the motor market. But the crowd has followed the plants of huge output and conventional construction.

Only two hundred American cars will go out into the several states this season, but each will be driven by a motor connoisseur who cares little

about first cost if power, service and value be there.

In your clubs, and wherever men meet to discuss the merits of motoring, you will hear its name with increasing frequency, displacing, as like as not, some other name that has hitherto been more familiar.

The philosophy of this you will better understand if you will study the smart make-up of the car; learn something of the unique underslung construction of the American Traveler and write for a descriptive account of its mechanical anatomy and performances.

SPECIFICATIONS OF THE AMERICAN TRAVELER.

Motor—Four cylinders cast in pairs; $5\frac{3}{8} \times 5\frac{1}{2}$ in. 50-60 H. P. Water cooled; centrifugal circulating pump.

Ignition—Bosch high tension magneto; auxiliary coil and battery.

Carbureter—Float feed, auxiliary air supply type.

Lubrication—Four-sight-feed lubricator for cylinders and mechanism. Splash oiling crankcase. Transmission and differential run in oil.

Clutch—Leather-faced, fan-bladed cone interlocked with emergency brake.

Drive—Direct shaft to differential and floating live rear axle that bears no weight.

Wheels—40x4 in. front, 40x4 in. rear.

Wheelbase—122 inches. Tread, 56 inches.

Equipment—Two gas headlights; tail lamp; trunk rack; acetylene generator; French horn; tool kit.

AMERICAN MOTOR CAR CO.
INDIANAPOLIS, IND,

Standard Manufacturers A. M. C. M. A.

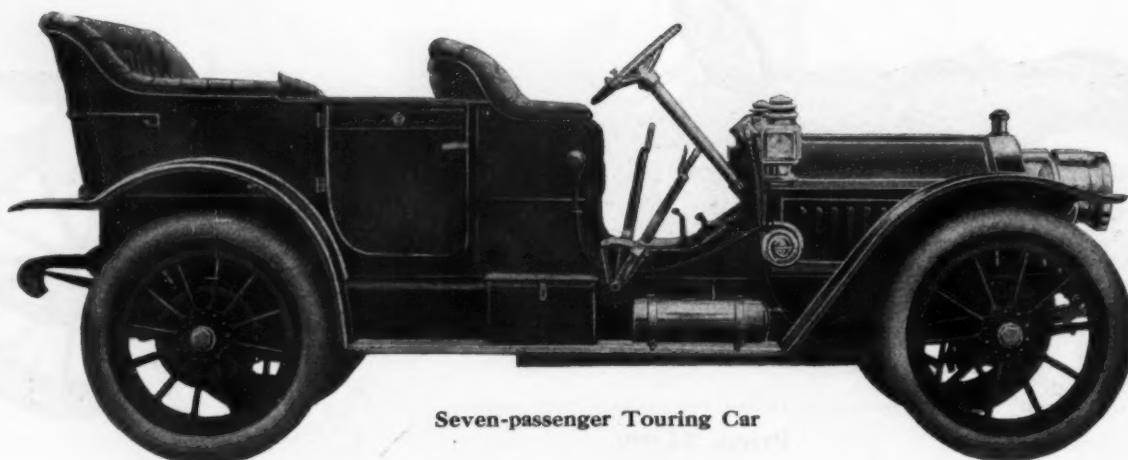
See the AMERICAN at the Grand Central
Palace Show this week



Not an Assembled CarNot an Assembled Car

The AMERICAN SIMPLEX

Fifty Horsepower Valveless Two cycle Engine Runs with the Smooth Rhythm and Applies Power with the Constancy of the Electric Motor



Seven-passenger Touring Car

50 H.P. FOUR CYLINDER, VALVELESS TWO CYCLE MOTOR

You may not live to see it, but the day is surely coming when the two cycle gas engine will be the only type used in motor cars.

It is inevitable.

We have recognized the virtues of the two cycle principle and incorporated it in the American Simplex first.

We are the pioneers among manufacturers of cars of the class in which the American Simplex stands.

Every manufacturer who puts into his car a six cylinder engine admits the vital deficiency of the four cycle principle—intermittent power—and his inability to overcome it.

Multiplicity of cylinders merely approaches—never attains—constant turning power—the continuous torque you've heard so much about.

The American Simplex two cycle engine applies power with the constancy of the electric motor.

There is not a valve, spring, roller cam or cam shaft on the American Simplex two cycle engine. They would be superfluous. They hinder the four cycle from generating

its power in a steady, unceasing rush—yet the four cycle engine cannot be built without them.

The American Simplex is a manufactured car.

It is manufactured in our own plant in its entirety—motor, transmission, differential, gears, frame—every part where strength or harmonious action is vital to the long life of the car and the smoothness with which its motor runs.

That is the reason the American Simplex is a motor car symphony—there is complete harmonization of parts which no assembled car can have.

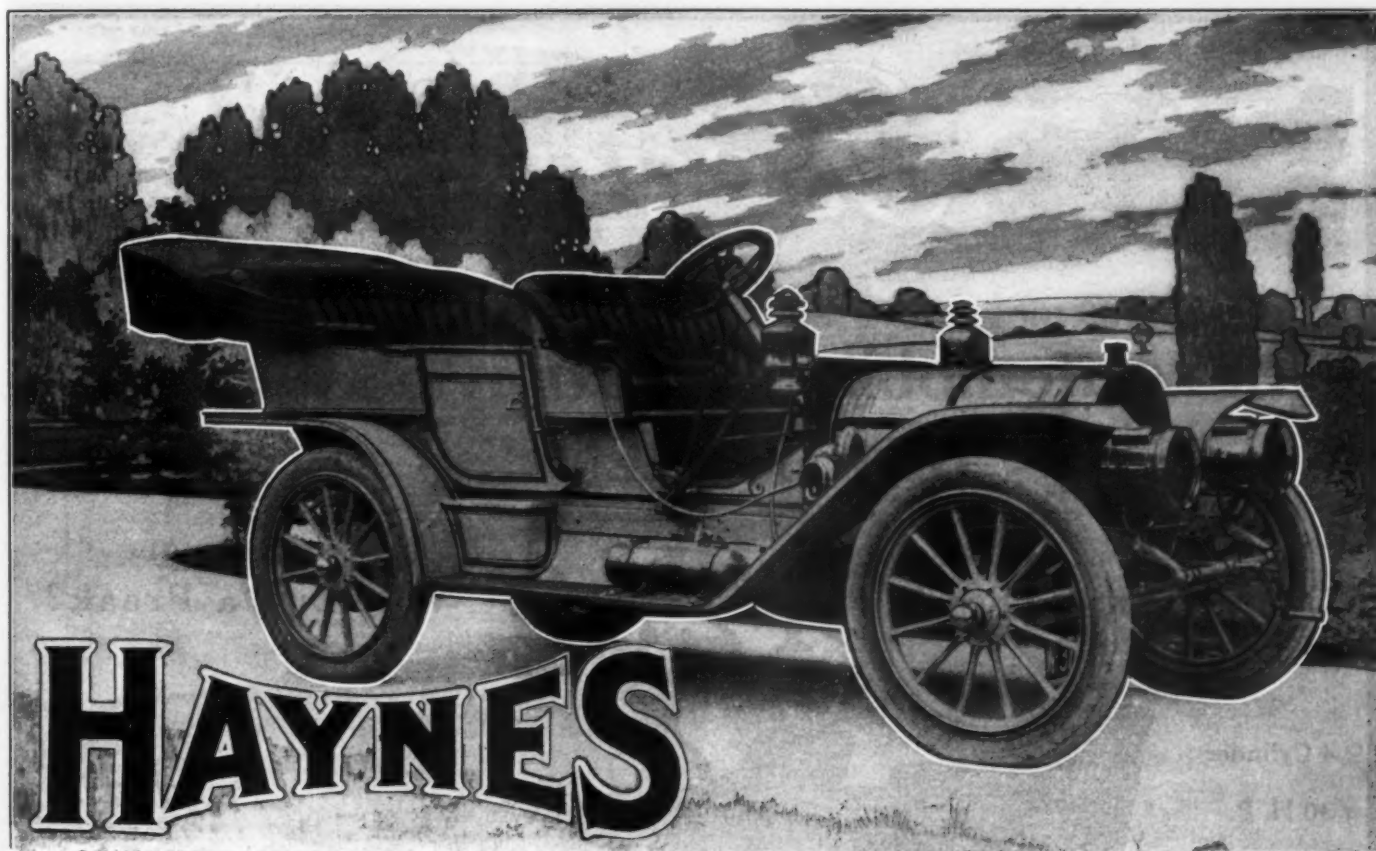
Our 1909 literature tells of the flexible three point motor suspension and radiator attachment; the rear axle transmission; the interlocking device on the gears; the improved torsion tube; the everlasting brake adjustment—every one a feature exclusive in the American Simplex—together with a comprehensive explanation of the differences in operation and results between the American Simplex valveless two cycle motor and all four cycle motors. Write for it.

Simplex Motor Car Company

Mishawaka, Ind.

Member A. M. C. M. A.

See the American Simplex in Space D, Grand Central Palace Show, New York, Dec. 31-Jan. 7. Demonstrating Car at the Show.



The Haynes for 1909—40 H P., \$3,000

A Talk to Agents

People are wary of the good-looking car that a chauffeur or an expert is unwilling to commend.

Possibly there are some agents who think that the merits of the Haynes universal joints, for instance, are too technical a matter to interest the average business man that comes in to look at the car. Maybe. But next day that man's friend, who knows an automobile when he sees it, steps in.

He gets into the chassis instead of into the tonneau.

He finds the universal joints with the floating cube of solid steel that can't ever break, and the big wearing faces that never wear out.

He finds other things, too—a unique and simple roller-pinion-and-sprocket direct drive that solves certain old problems at the rear axle, obviating

wear, strains, noise and friction at a place that is a danger point in most cars. He finds a better clutch than any other car ever had. He finds a ratchet gear system that prevents gear stripping. He finds a double flywheel on the motor that makes it run like a six-cylinder without a six-cylinder's cost and complication. And he finds tremendous strength, almost needless strength, everywhere.

And the man that sent him may not hear about those technical points, but he does hear something that makes him 'phone the agent to reserve that car till cheque arrives in the morning.

Certain Haynes territory is open this year, and we are ready to talk business if you are just the right man.

HAYNES AUTOMOBILE CO., Kokomo, Indiana

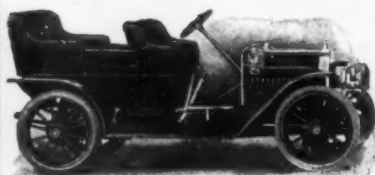
Oldest Automobile Manufacturers in America

Members A. L. A. M.

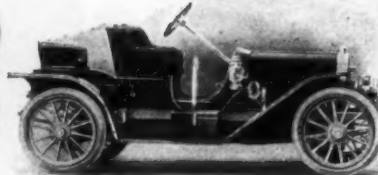
NEW YORK, 1715 Broadway

42 Highest Awards and Perfect Scores

CHICAGO, 1702 Michigan Ave.



Regal



The Automobile Sensation of the Year

There are some low-priced four-cylinder cars on the market.

BUT REMEMBER

The Regal is not an experiment. This is its 2d year and it has made good.

Compare it with a Regal

\$1250

Why buy a Freak?

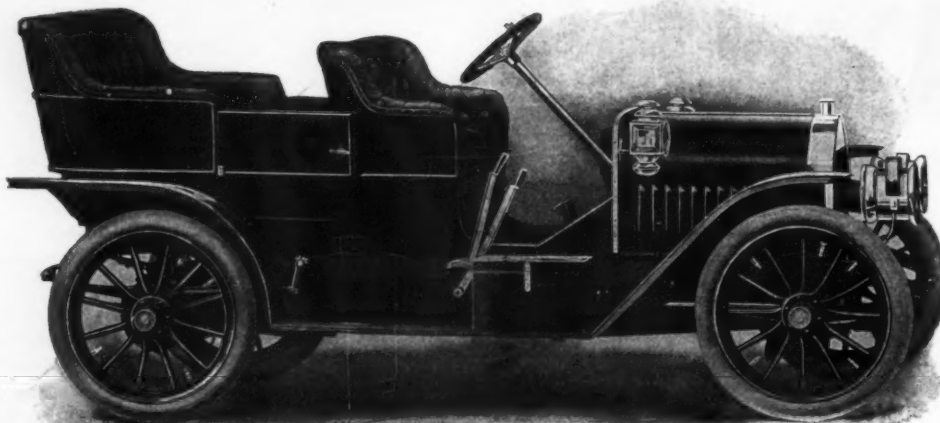
4 Cylinder

30 H. P.

Water Cooled

High Tension Magneto

105 in. Wheel Base



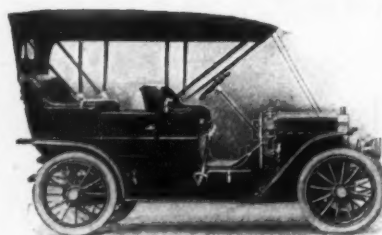
MODEL "A"
5 Passenger
Touring Car

MODEL "B"
3 or 4
Passenger
Runabout

Three speed and reverse selective type sliding gear transmission combined with rear axle. 32 inch wheels. 34 inch quick detachable tires. 12 spoke wheels, front and rear. The high tension magneto is a standard equipment on all models. Offset crankshaft. Exhaust and inlet valves interchangeable. Cone clutch.

The day of inflated ideas and enormous profits is passed. The automobile industry is settling down to a sane, business-like proposition. No more "Hurrah Boys" business. No more 100 per cent dividends and enormous expenses. The automobile must be produced on a manufacturing basis. Small profits. Large sales. Honest goods. If you want a car with no experiments, no freak ideas, no fads — just an automobile — buy a Regal.

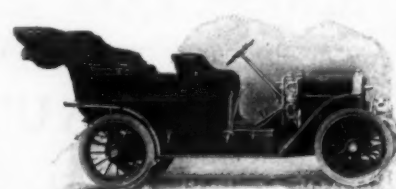
Further specifications are provided in our catalogue, which may be secured from our nearest representative or will be mailed direct upon request.



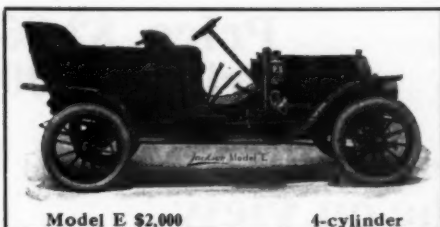
SEE OUR EXHIBIT AT THE NEW YORK
SHOW, GRAND CENTRAL PALACE

Regal Motor Car Co.

Trombley Ave., Detroit, Mich.



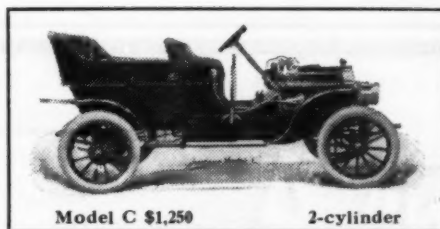
Jackson
AUTOMOBILES
Season
of 1909



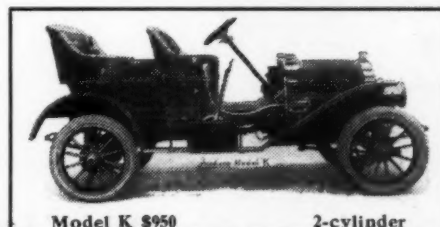
Model E \$2,000 4-cylinder



Model H \$1,600 4-cylinder



Model C \$1,250 2-cylinder



Model K \$950 2-cylinder



Model F \$850 2-cylinder

DEALERS

If you want a clean-cut, up-to-date, snappy, reliable line of cars — a complete line—a dependable line it is pleasant and profitable to sell —get the Jackson agency.

There are especially good features to be found in Jackson Cars which give them individuality. Every point is made a substantial point. Every unnecessary frill is cut out. Every possible provision is made for the comfort of those who ride in Jackson Cars, notably our Jackson special full elliptic springs, front and rear, made right and tempered right in our own spring plant. Jackson Cars are not only practical in every sense, but luxurious in their easy riding qualities.

1909 Models will be exhibited and demonstrated at the Grand Central Palace Show, New York, Dec. 31 —Jan. 6, and at the Coliseum Show, Chicago, Feb. 6—13.

NO SAND TOO DEEP NO HILL TOO STEEP

Jackson Automobile Company

Jackson, Mich.

The New Stevens-Duryea Models XXX and Y

will be on Exhibition at the Licensed Automobile Show, Madison Square Garden, New York City, January, 1909.

The XXX—A 24 Horse Power, 4-Cylinder Runabout, . **Price, \$2,850**
The Y—A 6-40 Horse Power, 6-Cylinder Touring Car, . **Price, \$4,000**

**The 4-Cylinder Model X and 6-Cylinder Model U
("Light Six") will also be on view**

The above Four Typical **Stevens-Duryea Cars** represent our 1909 productions.
 Write for detailed descriptive matter.

Stevens-Duryea Company

900 Main Street

CHICOPEE FALLS, MASS.

Member Association Licensed Automobile Manufacturers



TYPE "E" FIFTY

A custom-made car for particular people.

The same mechanical qualities that contribute to the success of the great type "C" Fifty.

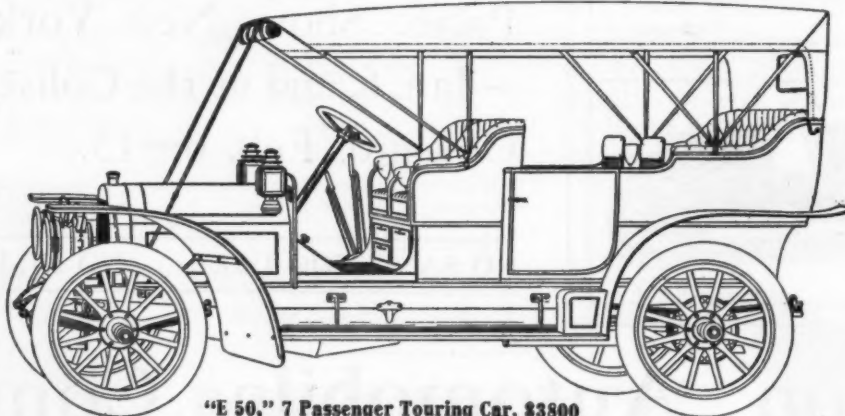
And in addition

Quinby Equipment, conveying quality and refinement in a luxurious and completely appointed seven-passenger touring car.

Type "C" Fifty
 Baby Tonneau and
 Touring Car . \$3,000

Type "D 25"
 Runabout . . \$2,000
 Baby Tonneau or
 Touring Car . \$2,100

Type "F" Six
 Baby Tonneau . \$4,500



"E 50," 7 Passenger Touring Car, \$3800

"Quinby" | equip-
 ment can be fur-
 nished on any of
 the above types,
 in any style, at an
 additional price.

All models equip-
 ped with magneto
 and gas tanks.

J. M. QUINBY & CO.
 101 Newark, N. J.
 Distributors in New York
 City and New Jersey.

Pennsylvania Auto Motor Company
 Bryn Mawr, Penna.

GRANT SQUARE
 AUTO CO.
 61 Brooklyn
 Brooklyn and Long Island
 Distributors.

14 Entries. Only one perfect score—The Franklin.

Against thirteen competitors, the 1909 Model D Franklin touring car won the only perfect score in the Worcester, Mass., reliability contest, December 12. Eight of the contestants went through the road run without penalization. But the Franklin was the only one to withstand the rigid examination after the run by a technical committee from the faculty of the Worcester Polytechnic Institute.

All except the Franklin suffered penalization due to broken, strained, bent or loosened parts leaks, etc.

It was necessary for the committee to go over the Franklin six times in order to satisfy the other competitors.

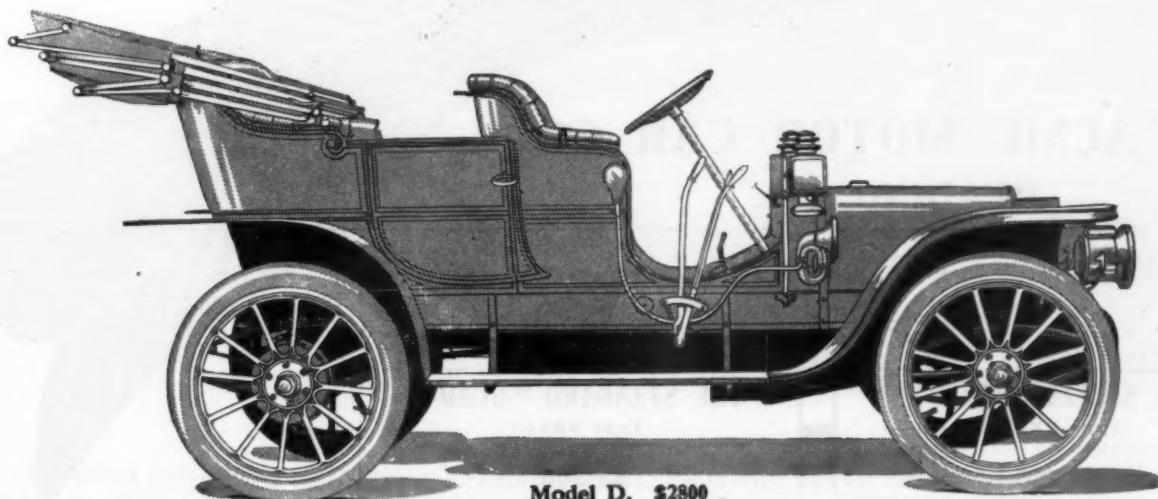
Was this luck? No!

This is the fifth severe contest in which a 1909 Franklin stock model has carried off the honors. Franklins won perfect scores in the Glidden Tour. The only Franklin entered in the Bretton Woods endurance run won a perfect score. Another Franklin won a perfect score in the 1000-mile Chicago reliability contest and also had the lowest gasoline consumption in its class. Still another Franklin won a perfect score in the Cleveland sealed bonnet run and had the lowest gasoline consumption of all contestants.

These five consecutive perfect scores in five consecutive contests, each with a stock model and—except in the Glidden Tour—only one in each contest, are most significant. How significant is of interest to every buyer of an automobile. No other automobile has such a record.

Most any automobile can make a hard road run without stops, but to go through without troubles of any kind and without any derangement or strains resulting is what tells the story.

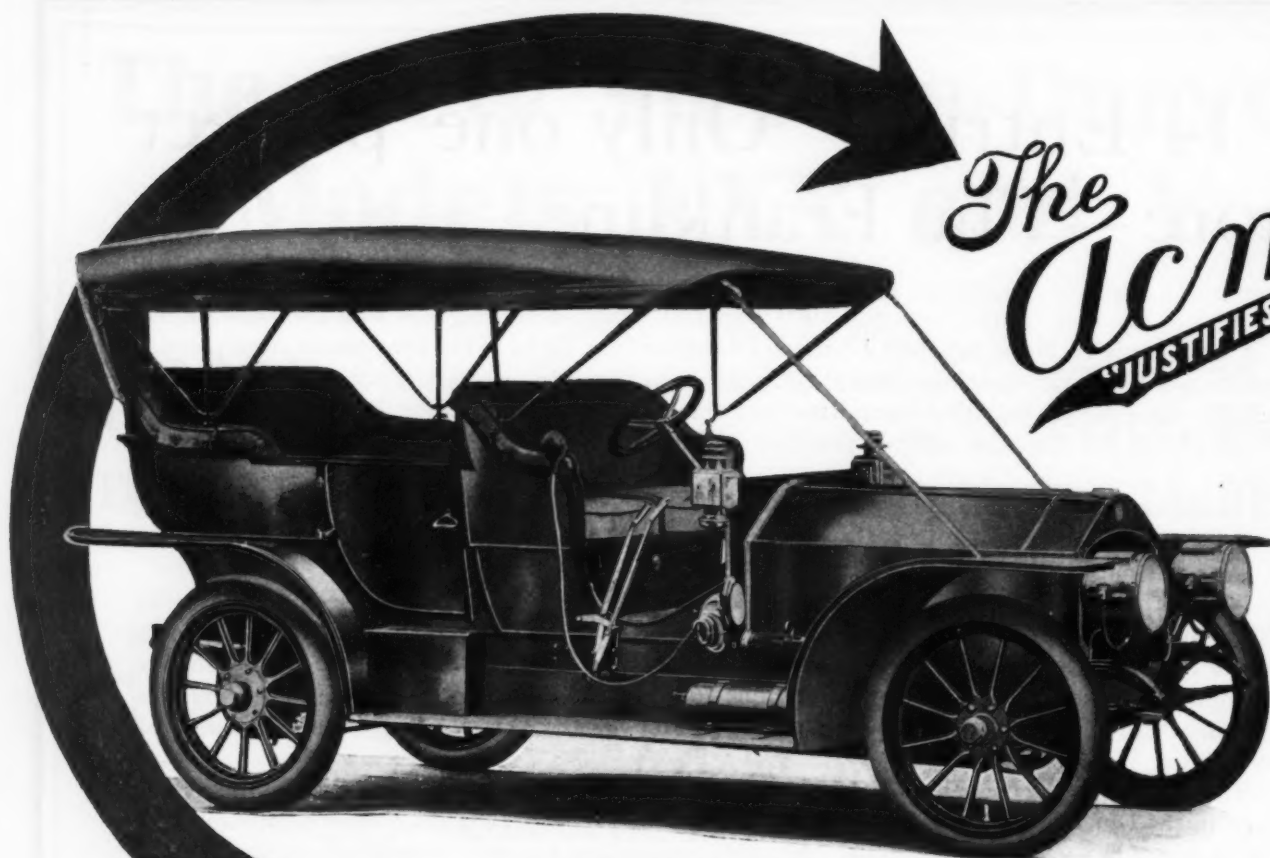
The light-weight air-cooled Franklin does not strain or rack itself. It stands up. It rides comfortably.



Model D. \$2800

A high-grade powerful automobile. Refined, reliable and safe. Abler for touring on American roads than any automobile but a Franklin. Beautiful to look at, comfortable to ride in and doing its work at the lowest operating cost.

H. H. FRANKLIN MFG. CO., Syracuse, N. Y.



The
Acme
"JUSTIFIES ITS NAME"

ACME SEXTUPLET
6 Cylinder, 50 H. P. \$4,500

THE ACME MOTOR CAR CO. READING, PA.

At the Grand Central Palace Show, December 31 to January 7,
we will exhibit the following 1909 models:

THE SPECIAL "QUAD"

(Type XXVII.)

Four cylinders, 5" x 5", 5 or 7 seats

\$3,750.

THE STANDARD "QUAD"

(Type XXVI.)

Four cylinders, 4½" x 5", 5 or 7 seats

\$3,500.

THE ACME SEXTUPLET

(Type XX.)

Six cylinders, 4½" x 5", 5 or 7 seats

\$4,500.

THE "FAIRMOUNT" SEXTUPLET

(Type XXL)

Six cylinders, 4½" x 5", Roadster or Tourabout

\$4,500.

THE ACME "MIDGET"

(Type XIX.)

Four cylinders, 4½" x 5", 2 passengers, shaft-drive

\$2,500.

THE "VANDERBILT" ACME

(Type XXV.)

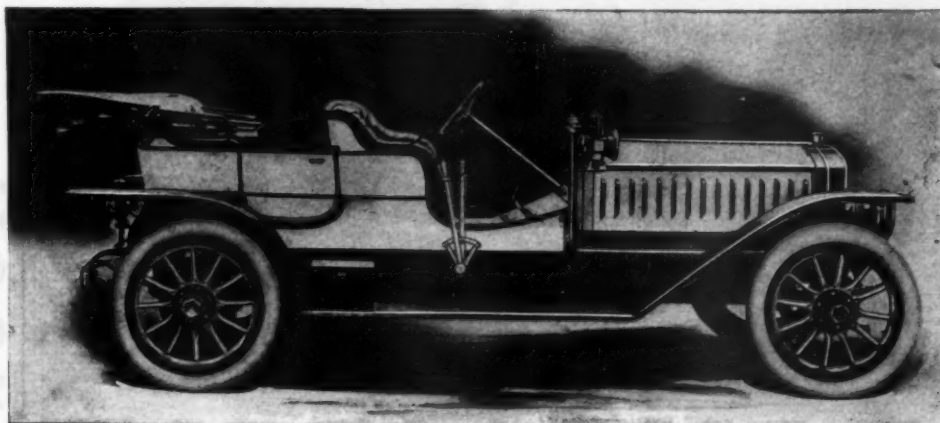
Six cylinders, 5" x 5", 5 or 7 seats

\$6,000.

We have a limited amount of unoccupied agency territory which we will close at the Show.

60 H. P. **AUSTIN** 90 H. P.
AND OUR NEW MODEL 45

Six Cylinders, $\frac{45}{50}$ H. P., 2250 Pounds, \$3000.00



*Unequaled
Combination*

*Highest Quality
and Power*

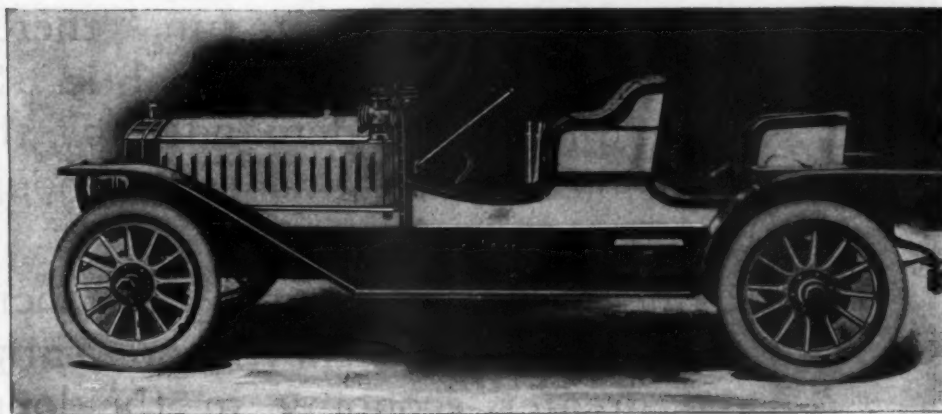
*Lowest Weight
and Price*

The Car That "JUST SUITS" Everybody

A Five-Passenger Touring Car with a Detachable Tonneau that can be replaced by a Rumble Seat in three minutes.

*Same Car
as a Roadster*

MODEL 45R
\$2850.00



Double Ignition, Selective Transmission, Floating Rear Axle, 36-inch Wheels, 122-inch Wheel Base; and the same highest quality of Material, Workmanship and Finish for which our cars have always been noted.

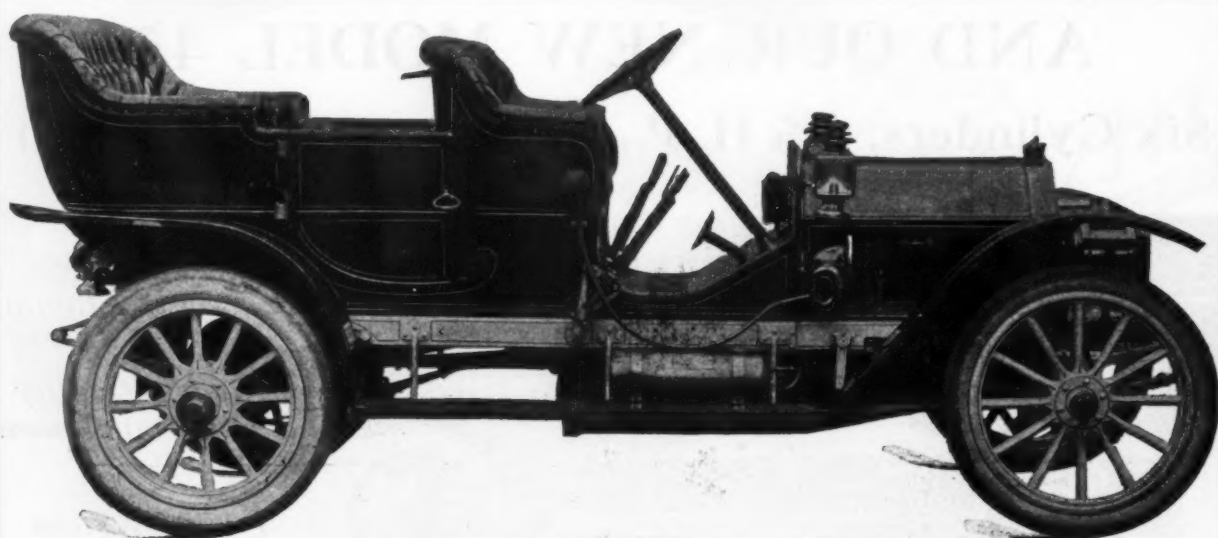
Write for Catalogue and complete description of our 1909 Models. We will exhibit at the Grand Central Palace Show, New York City, December 31st to January 7th.

CHICAGO BRANCH
 1420 Michigan Avenue

Austin Automobile Company, Grand Rapids, Mich.

Standard Manufacturers A. M. C. M. A

MOON—1909—MOON



MODEL C, 5-PASSENGER TOURING CAR.

REFINEMENT

The day of the slogan, "The car to get there and come back," is past. In 1909 the car that will not run "there and back," is not a **real automobile**. Something different is demanded by the responsible dealer and the thoughtful buyer—it is **refinement**.

Refinement that stands for increased strength and efficiency, more simplicity and greater economy in the long run is found in the 1909 Moon Thirty-Two.

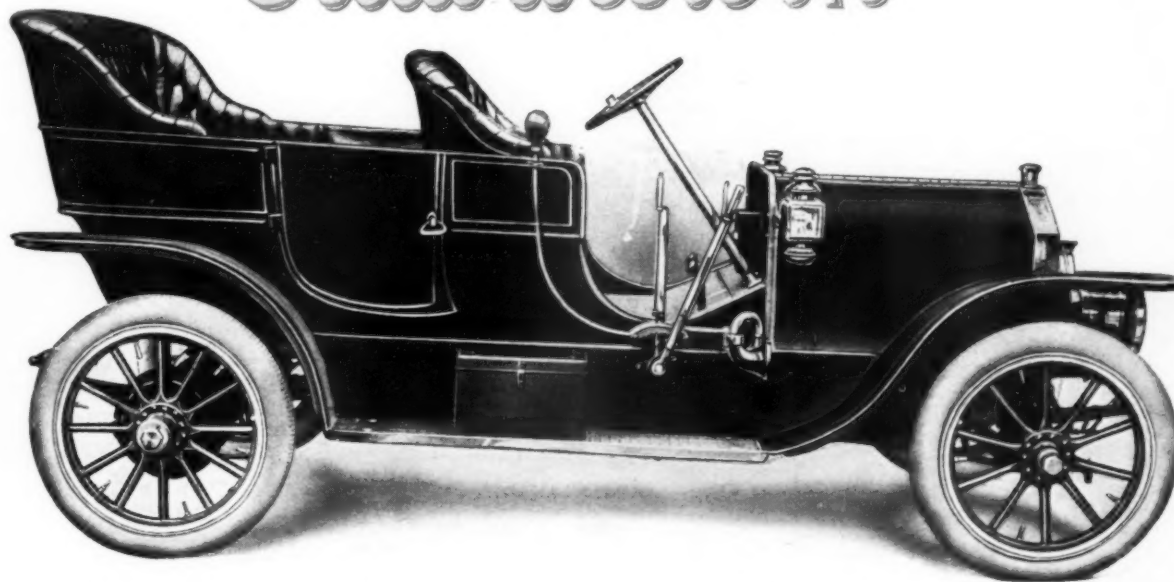
MOON MOTOR CAR COMPANY, Jos. W. Moon,
President
4402 Main Street, St. Louis, Mo., U.S.A.

MOON—1909—MOON

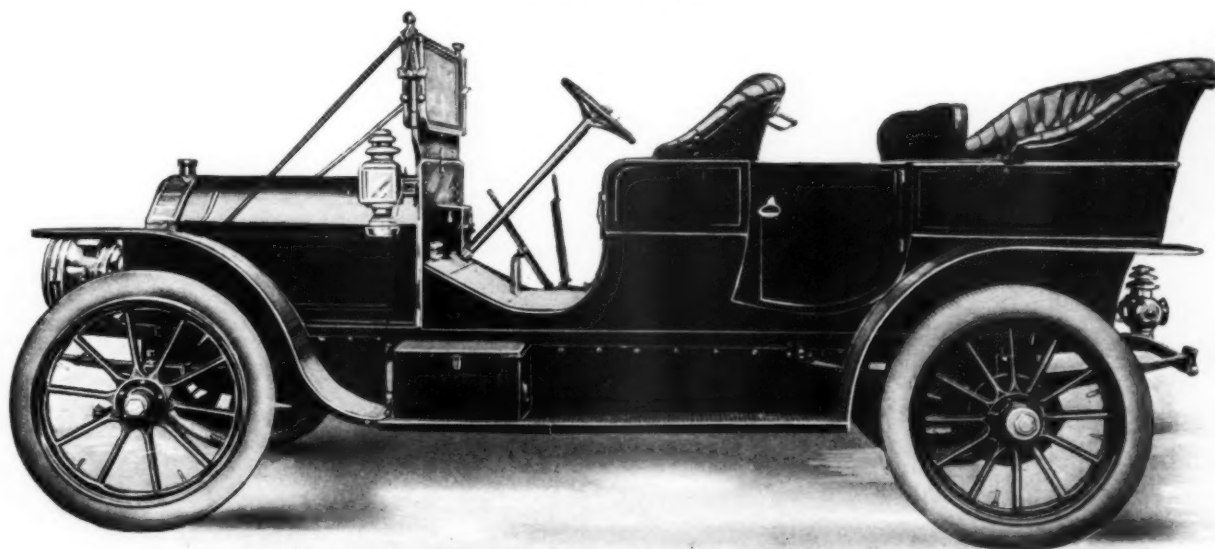
MOON THIRTY-TWO

MOON THIRTY-TWO

Great Western



No. 21—62½ lbs. per H.P. 40 H.P., 4-Cylinder Motor, 4 1-2" bore, 5½" stroke. Weight, with complete equipment, 2500 lbs.
Price, \$2500



No. 22—58½ lbs. per H.P. 50 H.P., 4-Cylinder Motor, 5" bore, 6" stroke. Weight, with full equipment, 2940 lbs.
Price, \$4000

MODEL AUTOMOBILE COMPANY

97 SMITH STREET

PERU, INDIANA, U. S. A.

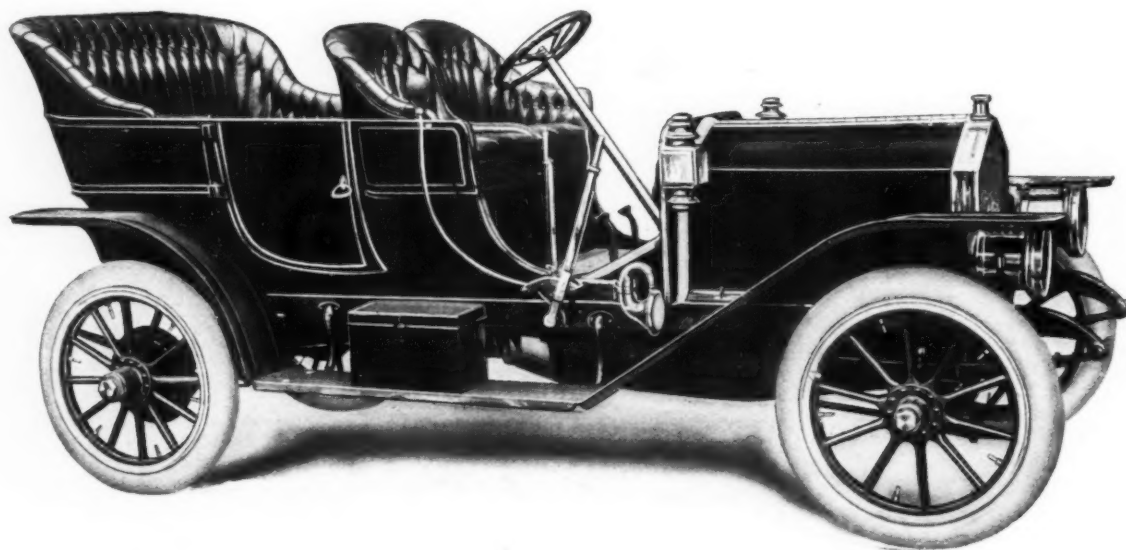
DISTRIBUTING AGENCY

GREAT WESTERN AUTOMOBILE COMPANY

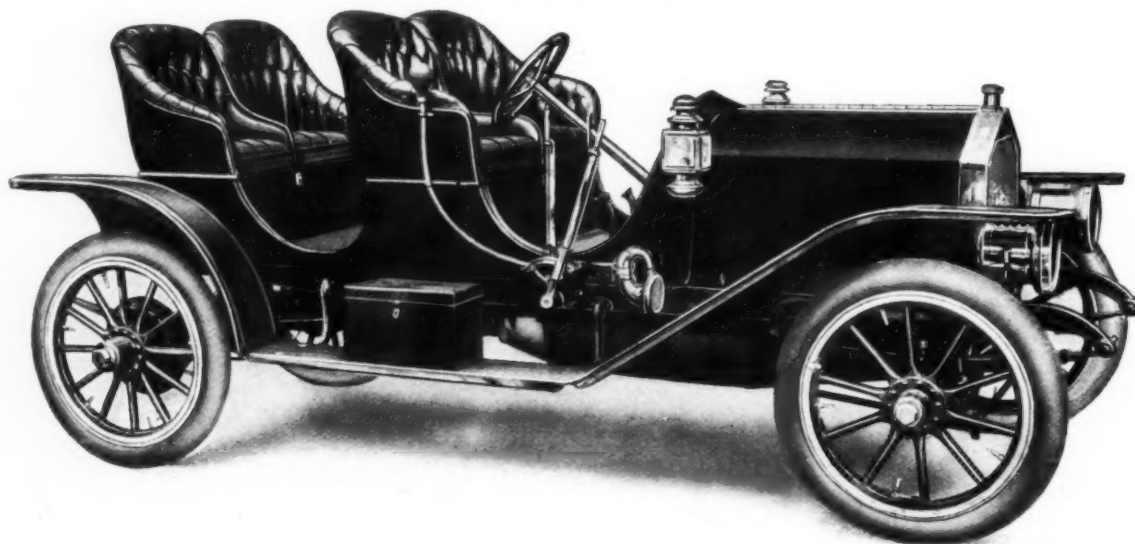
1706-8 MAIN STREET

KANSAS CITY, MISSOURI

Great Western



No. 20—66 $\frac{2}{3}$ lbs. per H.P. 30 H.P., 4-Cylinder Motor, 4" bore, 5" stroke. Weight, with complete equipment, 2000 lbs.
Price, \$1600



No. 20-A—63 $\frac{1}{2}$ lbs. per H.P. 30 H.P., 4-Cylinder Motor, 4" bore, 5" stroke. Weight, with complete equipment, 1900 lbs.
Price, \$1600

MODEL AUTOMOBILE COMPANY

97 SMITH STREET

PERU, INDIANA, U. S. A.

DISTRIBUTING AGENCY

GREAT WESTERN AUTOMOBILE COMPANY

1706-8 MAIN STREET

KANSAS CITY, MISSOURI



High compression and air cooling do not go together on any car but the ADAMS-FARWELL.

The Adams Co., Dubuque, Iowa

Studebaker

Gasoline and Electric—for Pleasure and Business
Studebaker Automobile Co., South Bend, Indiana



The Greatest Value Ever Offered
\$2,250

4 Cylinder 35 H.P. Motor
Cornish-Friedberg
Motor Car Co.
1233 Michigan Avenue
CHICAGO

CAMERON

AIR-COOLED

RUNABOUTS & TOURING CARS

4 cyl., 20-24 H. P., 3 Speed Selective,

\$900 \$1100

6 cyl. 30-36 H. P. \$1500

Equipment of all models includes

Remy High-Tension Magneto

CAMERON CAR CO., Beverly, Mass.

The 28-30 H.P. Mitchell--\$1500

Includes genuine \$150 Splitdorf Magneto (free) and 1/2 inch larger tires than you get with any other car at this price. To have other cars equipped with these tires you must pay \$50 extra.

Write for full information today.

MITCHELL MOTOR CAR CO.
538 Mitchell St. Racine, Wis.
Standard Manufacturers A.M.C.M.A.

Groat

Gasoline
Cars

CATALOG READY
GROUT AUTOMOBILE CO.
Orange, Mass.

The *Locomobile*
Co. of America

BRIDGEPORT, CONN.
A. L. A. M.



Assemble your 6 cylinder car. Write for circular.
HOWARD MOTOR WORKS, Yonkers, N. Y.

"PITTSBURGH SIX" FOR 1909

Now Ready

6 Cylinders. 60 Horse Power, Fully
Equipped. 4 Models

\$2,750 \$2,800 \$3,000 \$3,250

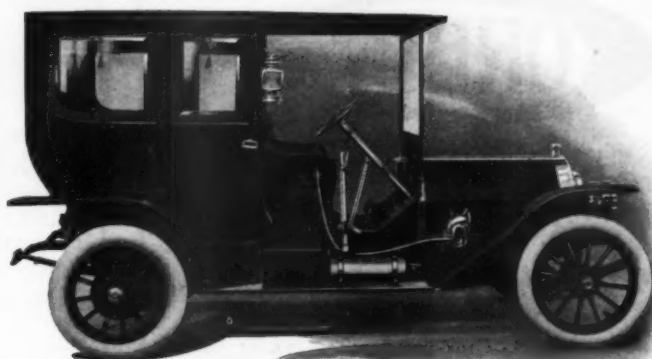
Send for Catalog

FORT PITT MOTOR MFG. CO.
NEW KENSINGTON, PA.

REO \$500 and
\$1000

Gets there-and-back, every day in the year, and that's what counts most. Send for catalogue.

R. M. OWEN & CO., Lansing, Mich.
General Sales Agents for the REO Motor Car Co.



A hundred cars will confront you at the show

There will be expensive cars and "cheap" cars, big cars and little cars, cars with this feature, cars with that, all claiming to be the BEST.

BE CAUTIOUS.

Look for the car that has plenty of size for comfort, plenty of power for speed and hill climbing, plenty of style for appearance, made throughout of reliable, durable material and selling at a moderate price.

All this you will find in the

1909

Speedwell

The price is \$2,500, completely equipped. A marvel of grace, construction, durability and reliability at the highest price that anyone should pay for any car.

The Speedwell Motor Car Co., Dayton, Ohio

New York Office, 2002 Broadway, at 68th Street

Exhibiting at the Shows.

**ONE QUALITY FOR ALL MODELS
ONE PRICE FOR ALL BUYERS**

Stoddard-Dayton

Touring Cars, Roadsters, Runabouts, Limousine, Coupe and Landulet. A Line of American cars that **STAND OUT** :: Write for '09 Catalog

THE DAYTON MOTOR CAR CO., Dayton, Ohio

The Gaeth Proposition for the Dealer Is Exceptional—Investigate IT!

Four Models—7-Passenger Touring Car, Short Coupled Body, Tourabout, Limousine, all \$3,500

(except the Limousine)

Write us to write you what we will do. Address Dept. A

THE GAETH AUTOMOBILE CO.
Member A.M.C.M.A CLEVELAND, O.



For - ABILITY - Note our Hill Climb Records
ENDURANCE - Note our Kansas City perfect score
SATISFACTION - Consult our customers
APPEARANCE - SEE OUR CAR.

CORBIN MOTOR VEHICLE CORPORATION,
New Britain, Conn.

Will exhibit at Madison Sq. Garden Show, Jan. 16-23, 1909



One of the features of the Grand Central Palace Auto Show, opening in New York City on New Year's eve, will be the exhibit of the famous "MIDLAND MOTOR CAR." For its lightness, its enormous power and speed, the MIDLAND, at \$2,250, has few rivals in the American field to-day. Its friends say of it that it's "Made right looks right and stays right."

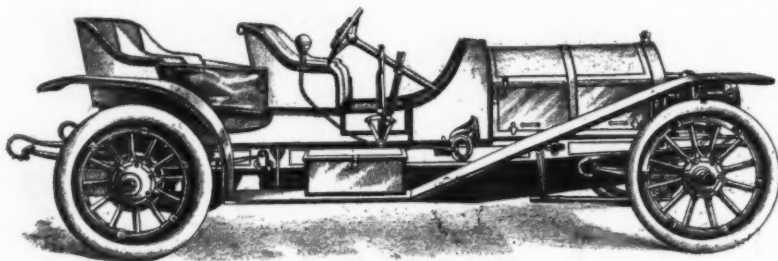
MIDLAND MOTOR CO., Moline, Ill.

AGENTS WANTED WHERE NOT REPRESENTED

1909 MODELS

INCLUDE

48 H. P. Racers, Runabouts, Touring Cars & Limousines



MEADOWBROOK MODEL—Winner of the \$1000 Cash Prize—
Opening of Vanderbilt Course

EXHIBITING AT PALACE SHOW

17-22 H. P. TOWN CARS \$3200.00

TAXICABS COMPLETE AND CHASSIS

THE LARGEST AND BEST EQUIPPED FACTORY IN THE WORLD

Allen Kingston Motor Car Co., 3 WEST 44th STREET
NEW YORK

WALTER C. ALLEN, President

New England Agency, 887 Boylston Street, Boston, Mass.

THE CAR De Luxe

OLDSMOBILE

You see them wherever you go
They go wherever you see them

OLDS MOTOR WORKS
Lansing, Mich.

MEMBERS A.L.A.M.

The Automobile Handbook

A practical book for owners, operators, and mechanics. Includes road troubles, motor difficulties and other contingencies and how to handle them. By L. ELLIOTT BROOKS. 320 pages. Numerous illustrations. Full leather, limp. Price, \$1.50. Address The Automobile, 231-241 West 39th St., New York.



Get the \$250 Original Motor Buggy \$400 for 12 H. P. Top \$25 extra. Over 600 in use. Invented by an engineer after 10 years labor in auto work. Speed 4 to 40 miles per hour. 50 to 100 miles on one gallon of gasoline. Will climb steep hills and run in mud and sand.

Guaranteed for one year. Write for catalogue, testimonial letters, etc.
Success Auto Buggy Mfg. Co. (Incorporated)
528 De Baliviere Ave., St. Louis, Mo.

"CAR COMING!"



We will
NOT
Exhibit at
the
Shows

We will
NOT
Exhibit at
the
Shows

"In building the Velie Automobiles, we have sought to employ the same correct, modern and economical methods of manufacture that have brought so prominently into good repute the vehicle of the same name."

VELIE MOTOR VEHICLE CO.

CHICAGO BRANCH
1615-17 Michigan Ave.

MOLINE, ILL.

\$1750

F. O. B. MOLINE

Equipped with Magneto, Speedometer, Glass Front,
5 Lamps, Generator, Jack and Tools. Guaranteed.

\$1750

F. O. B. MOLINE

The "VELIE 30" has a 30 H. P. Motor, Selective Type Transmission,
Floating Type of Axle, 110-inch Wheel Base, Touring
Car, Baby Tonneau and Roadster.

AGENTS THERE ARE REASONS WHY THIS AGENCY IS VALU-
ABLE TO YOU. WRITE FOR REASONS AND DETAILS

VELIE MOTOR VEHICLE CO.

1615-17 Michigan Avenue

FACTORY: MOLINE, ILL.

CHICAGO, ILL.

Our Mr. H. C. Moore
will be at the New
Astor House during
show week, December
31st to January 7th.

E-M-F \$1,250

F. O. B. DETROIT, MICHIGAN

MAGNETO INCLUDED —OF COURSE



IF YOU'VE DECIDED TO BUY AN AUTOMOBILE

AN AD—FULL OF ADJECTIVES—a page of pretty platitudes will not suffice to appease your craving for facts and figures—if you've made up your mind you will buy a car and it's now only a matter of deciding which car will best suit your particular needs.

YOU WANT INFORMATION—some facts you can tie to—some points you can compare—and the more the better—with similar points in other cars.

SO WE WON'T WASTE WORDS in this ad—we'll give you facts boiled down in the form of complete specifications showing just how the E-M-F "30" is made, of what, and why.

YOU'LL FIND BY COMPARISON that this car is a full-sized, 5-passenger automobile. Same dimensions as other cars selling for twice as much, and larger—much larger—than any other car selling for the same price.

IF YOU ARE VERSED in the mechanical lore of motor car construction you will find all you desire here. If you don't know, then you know someone who does know—and the more he knows about points that spell superiority in a car the stronger will be his verdict in favor of the E-M-F "30."

AFTER YOU HAVE DIGESTED THIS thoroughly look up the nearest E-M-F "30" dealer—there are 500 of them—and arrange for a demonstration—that will settle the question.

SPECIFICATIONS:

MOTOR—HORSEPOWER—30.

TYPE. 4 cylinder, Vertical, 4 cycle. Cylinders cast in pairs with water jackets integral. Water space between cylinders ensuring uniform expansion and contraction. Valves all one side. Mechanically operated. Interchangeable.

CYLINDERS. Bore 4". Stroke 4½". Compression—moderate. All experience has proven these cylinder dimensions to be nearly ideal for all kinds of service. They give a motor of moderate speed—which means long life. Cooling, lubricating and all other troubles which arise from short stroke, excessive bore, small exhaust valves and short bearings are entirely eliminated in the E-M-F "30."

CRANK CASE. Cast from highest grade aluminum. Hand hole covers, stamped steel. Instead of the usual cast aluminum arms for supporting motor in frame the E-M-F motor is carried on pressed steel members in "U" section—no heavier—three times as strong.

VALVES. Are extra large—2½"—made from special steel, drop forged. Stems and seats ground. Valve guides machined and pressed into place instead of being cast integral with cylinders—easily replaced when worn.

All engineers agree that large valves not only make for efficiency, but also for economy. A four cylinder motor of 4" x 4½" may, by

scientific design, accurate workmanship and large valves be made to develop 30 to 35 horsepower at 1,000 revolutions per minute, or it may develop 16—if valves are under size or the design faulty in other ways.

VALVE PORTS. Inlet and exhaust passages very large and unobstructed—eliminating all chance of eddy-currents, ensuring maximum power efficiency and perfect cooling qualities.

VALVE OPERATION. Single cam-shaft made from high grade steel, drop forged with all cams integral. After milling, cam-shaft is case hardened, and all cam surfaces as well as bearings are ground to micrometrical accuracy—guarantees silent running and consistent performance at all times.

CRANK SHAFT. Is off-set ¾" from centre line of cylinders—still another increase in power efficiency with minimum of wear on cylinder walls and pistons. Crank shaft, drop forged from special steel. Three main bearings—all large and extra long. All bearing surfaces ground. Flange, forged integral on crankshaft carries fly-wheel—ground to ensure perfect centre. Fly-wheel is also given a running balance at maximum motor speed to ensure accuracy and absence of vibration.

CRANK SHAFT BEARINGS. Special babbit ("White metal" alloy) in accordance with best modern practice. Cam, shaft bearings, phosphor-bronze.

CONNECTING RODS. Drop forged steel. I-beam cross section. Crank-pin bearing equal length each side of centre—not off-set. Piston pin bearings, phosphor-bronze. Wrist pin bearings, marine type—not hinged. Lined with die-cast babbit. Shims provided for adjustment, which is easily made through large hand holes in bottom of crank case.

PISTONS. Extra long—5"—ensuring good compression and long life. Each piston ground, fitted with four rings, and *each set is weighed* to ensure perfect balance of reciprocating parts—a talking-point with some makers—a matter of course with us.

PISTON RINGS. Eccentric type; ground on periphery-face to conform to exact bore of cylinder; also on both sides.

PISTON PIN. Special case-hardened steel ground; drilled hollow to ensure perfect lubrication. Pistons, connecting rods, crank-shafts and all reciprocating parts are *mechanically balanced* to eliminate vibration.

LUBRICATION. Splash—automatic, vacuum feed—reliable and economical. Oil reservoir cast integral with aluminum crank case. After having tried countless mechanical "positive feed" oiling devices and found them all wanting in some particular, foremost engineers have decided that the only really positive feed is by gravity; and experience proves that no amount of piping to cylinders and bearings will ensure the same liberal oiling to all moving parts as the old, original splash system, by which the entire mechanism is kept constantly bathed in oil. The one shortcoming of the gravity feed system was the necessity for throttling the feed to prevent flooding, and the tubes frequently became clogged at the valves.

By our system of vacuum regulation—the utilization of one of the simplest principles in nature—we are able to use large tubes, $\frac{3}{4}$ ". This absolutely insures free flow of oil from the reservoir, and a constant level in the crank case. Radius: on one filling of oil reservoir, 300 to 500 miles, according to road conditions.

COTTER PINS, lock-nuts, keys and taper pins are used at every point to guard against any part getting loose.

OIL CUPS. Are provided for every joint that may at any time require lubrication—steering knuckles, spring connections, operating shafts, etc., etc.

IGNITION. Double system, consisting of (a) magneto, (b) battery. The magneto is not an extra or "special equipment." It is as much a part of the E-M-F. motor as the valves, and is included in the list price of the car. Gears and all moving parts enclosed in oil tight, dust and water proof case. In this regard the E-M-F. car sets a pace for the world, high priced cars included.

ENGINE GEARS. Cam-shaft and Magneto gears all enclosed and separated from crank chamber. Gears lubricated by non-fluid grease—not cylinder oil.

COOLING. Is by large centrifugal pump—high efficiency at slow engine speeds ensuring cooling in hill climbing and hard pulling over muddy roads. Belt driven, stamped steel fan mounted on engine—not attached to radiator. Eccentric belt adjustment.

CARBURETOR. Improved simple float, single jet—our own design. Very flexible and economical. Carburetor is located on driver's side of motor, away from hot exhaust pipes and other parts—readily accessible.

CLUTCH. Improved expanding-ring type. Leather faced. Contained in fly-wheel. Oil groove in fly-wheel with holes drilled for escape of oil obviates all liability of clutch slipping from this cause. Takes hold gently—and holds when engaged. Adjustment, accessible and easy.

TRANSMISSION. Type—Selective sliding gear. Gear case integral with differential housing in rear axle—"the unit power transmission system" so generally approved by engineers of late. Gears made from E-M-F. formula special steel. Accurately cut and oil treated. Instead of squared shaft for sliding gears, round shaft with four keys integral has been adopted—key-ways milled and ground. *Gear centers also ground* to ensure perfect alignment on shaft and silent running—details of construction heretofore known only to the highest priced cars.

SPEEDS. Three forward and reverse—direct on third.

GEAR RATIO. Standard, $\frac{3}{4}$ to 1. Speed of car, 50 miles an hour, down to 2, (you won't believe it till we show you) on high.

DRIVE. Direct through universal jointed propeller shaft to bevel gear on differential. Two universal joints. Pressed steel torque shaft. Gears extra large, accurately cut and made from special alloy steel.

DIFFERENTIAL. Bevel gear type—four pinions—another feature heretofore considered too expensive for any but high priced cars.

REAR AXLE. E-M-F. exclusive design. Right and left housing sections drawn from sheet steel and heat treated, giving extra strength. Fitted with truss rods. Hyatt Roller Bearings in hardened and ground removable sleeves carry load. Differential thrust bearings, babbit between ground steel washers. No balls to split—no adjustment to get out of order. Made right to stay right. Thrust of drive pinion supported by Timken Roller Bearing.

Auto-genous welding—acetylene-oxygen process—discussed so much in

engineering circles and trade journals of late is used in this axle as well as in several other parts of the car.

Thanks to drawn steel, auto-genous welding and "clean" design, this axle is lighter than any other live or floating axle on cars of similar weight and power—notwithstanding the entire transmission mechanism is incorporated in it.

All gears—transmission and differential—as well as all shifting mechanism, are immersed in an oil bath. And the transmission-axle case as well as motor crank-case are absolutely oil tight—no mucking of floor boards or dripping on pavements. Provision is made to prevent the oil working out at the axle ends when the car is left standing on an incline. Liberal road clearance.

FRONT AXLE. I-beam type. Drop forged in one piece—not welded in centre. Heat treated. Spring perches forged integral. Liberal safety factor. Spindles off-set back of yoke-posts—scientifically correct—affords easy steering, with tendency to go in straight line. Steering knuckles and all connections drop forged from steel—no castings. Two-point ball bearings, hubs and all joints bronze bushed.

STEERING GEAR. Irreversible, worm and sector made from special steel case hardened. All bearing surface-ground. Connection from steering arm, at right, to left knuckle arm, obviates all tendency to "crankiness" on rough roads.

CONTROL. Gear-shift lever at right of driver. Throttle and spark levers on left side of steering post, below wheel—operated by fingers of left hand without releasing grasp on wheel. Right hand free for emergency brake and gear shifting—the ideal control, rapidly superseding the fad for levers on top of wheel. Auxiliary foot accelerator. Clutch operated by left foot, service brake by right foot. Emergency brake by hand lever on right—ratchet lock.

WHEELS. Artillery type. Large spokes—12. Spokes and felloes first grade second growth hickory.

TIRES. $32" \times 3\frac{1}{2}"$ on all wheels. Morgan & Wright. Universal quick-detachable rims.

BRAKES. Four—all acting on rear hubs—none on transmission. Service brake, contracting steel bands, camel-hair lined, acting on pressed steel drums integral with rear hubs. Emergency brakes, internal expanding rings in same drum—metal-to-metal. Both sets double acting. Grip on drum is intensified by motion of car after brakes have been applied. Service brakes being on outside renders adjustment easy. Pressed steel disc closes drum, making it dust proof.

SPRINGS. Front, semi-elliptic. Rear, full elliptic. Extra wide for this weight of car—2". Driving thrusts and braking strains taken by two radius rods—not by springs.

FRAME. Pressed steel—U-section. Side members straight—weakened neither by off-setting nor dropping.

MUFFLER. E-M-F. design, silent. Silences by radiation—not by obstruction. Absolutely no back-pressure.

FENDERS. Enameled steel in the newest style, most approved enclosed-full-length-of-the-car type.

MATERIALS. Cylinders made from special formula highest grade, fine grain, gray iron. Intake pipe, brass. Exhaust pipe, gray iron. Crank case, aluminum. Frame, gears, springs, axles and driving shafts all made from special steels—each from an alloy best suited to its peculiar service, and all from E-M-F. formula. Operating levers, spring supports, spring clips, shackles, brackets, rod-ends, etc., steel, heat treated. All smaller parts, not drop forged, are pressed or stamped steel—no malleable castings enter into the construction of the car—maximum strength with minimum weight, and *absolute assurance* of the safety factor desired.

BODY TYPES

TOURING CAR. 5 passenger, roomy tonneau with liberal leg-room. Latest style, most approved, straight-line type. Handsomely finished.

The "TOURABOUT"—an E-M-F. innovation. A classy 4-passenger car. Rear seats detachable, leaving room for trunks and baggage. A rumble seat is included in regular equipment; when attached makes a natty 3-passenger roadster.

WHEEL BASE. 106". **TREAD.** Standard—56 $\frac{1}{2}$ ". Special for Southern Roads 61".

WEIGHT. Touring Car slightly under 1,800 pounds.

GASOLINE CAPACITY. 15 gallons. **OIL,** 1 gallon.

COLOR. E-M-F. Red.

PRICE. With standard equipment, pair acetylene headlights, and generator; side oil lamps, tail lamp, lamp brackets, tube horn, tire repair kit and tools—magneto included of course—\$1,250 F. O. B., Detroit, Mich.

WE WILL EXHIBIT AT THE MADISON SQUARE GARDEN SHOW, JANUARY 16th TO 23rd, 1909

EVERITT-METZGER-FLANDERS CO.

Members of Association Licensed Automobile Manufacturers

DETROIT, MICHIGAN

The debutante of the season, the "EWING" car, will make its bow to the Public on New Year's Eve, before the footlights of the American Motor Car Manufacturers' Association, at their Ninth International Automobile Show at Central Palace, New York.

The "EWING" car has been designed by a staff of competent engineers under the direction of Mr. L. P. Mooers, with a view to building what the trade of the world has demanded, a thoroughly high class up-to-date Town-car and Taximeter-cab. This has been accomplished by the Cleveland Autocab Company, at Geneva, Ohio.

BUILT FOR RELIABILITY, WITH BEAUTY OF DESIGN UNSURPASSED.

Write for descriptive circular and prices.

The Automobile Trade Directory

Subscription Price, \$5.00 a Year
Single Copies \$1.50

231-241 West 39th Street
NEW YORK

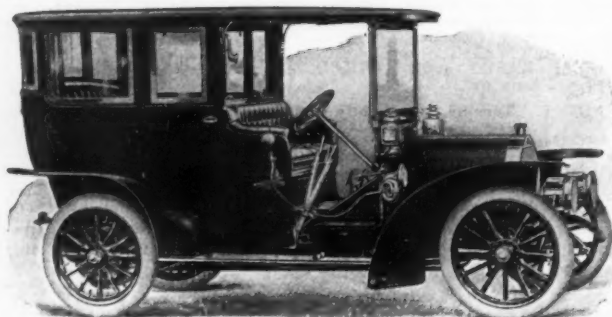
The sole purpose of The Automobile Trade Directory is to tell the buyer **who** makes the thing he wants and the arrangement of our classified lists presents the advertiser's name and announcement to the purchaser just when the latter wants the identical thing advertised. It is constantly referred to by Managers, Mechanical Engineers, Superintendents, Purchasing Agents, the men who **specify** and **buy** parts and material for the construction of cars, and by Dealers, Garages, Supply Houses, and **the entire trade.**

Advertisers are loaned our complete Mailing List of the trade to enable them to "follow up" their advertising in the Directory. Write us for full particulars.

Matheson

1909 Prices Reduced \$1,000

In order to sell hereafter this highest of all high-grade cars at the price of the cheaper cars, we have increased our working capital by \$350,000 and will double our factory output. Send for our book of customer's letters telling of the experiences of the most prominent men of affairs in this country with their Matheson cars, covering thousands of miles of service everywhere.



	New Price	Former Price
50 H. P. 1909 Touring Car ..	\$4,500	\$5,500
50 H. P. 1909 Roadster	4,350	5,000
50 H. P. 1909 Tourabout	4,350	5,000
50 H. P. 1909 Limousine	5,500	6,500
50 H. P. 1909 Landaulet.	5,500	6,500

MATHESON AUTOMOBILE CO.

Main Sales Office, 1886-1888 Broadway, New York City
Dealers wanted in all open territory

Automobile Catechism

For the Use of Owners and Drivers of Cars Fitted
with Internal Combustion Motors

BY

FORREST R. JONES, M.E.

President of the Manhattan Automobile School

THIS is the most practical, up-to-date work on the subject in the English language. It is published in pocketbook form, with high-grade leather cover, and printed on especially tough paper, as it is intended to be the inseparable companion of the autoist when on tour. Not a line is wasted on obsolete constructions or descriptions of unfamiliar apparatus. It treats of the automobile in modern form and of all the troubles that may arise in the course of ordinary use and that may be remedied by the driver himself. It is written in plain language and is the most helpful, authoritative, and comprehensive manual that has yet appeared. The subject matter is in the form of question and answer, and an exhaustive cross index makes immediate reference possible in any particular case.

Size, 4½ by 7 inches. Pages 134.

With Drawings.

Price, in genuine Morocco Cover, gilt edges, \$2.00
Including postage

Order from the publishers

The Class Journal Company

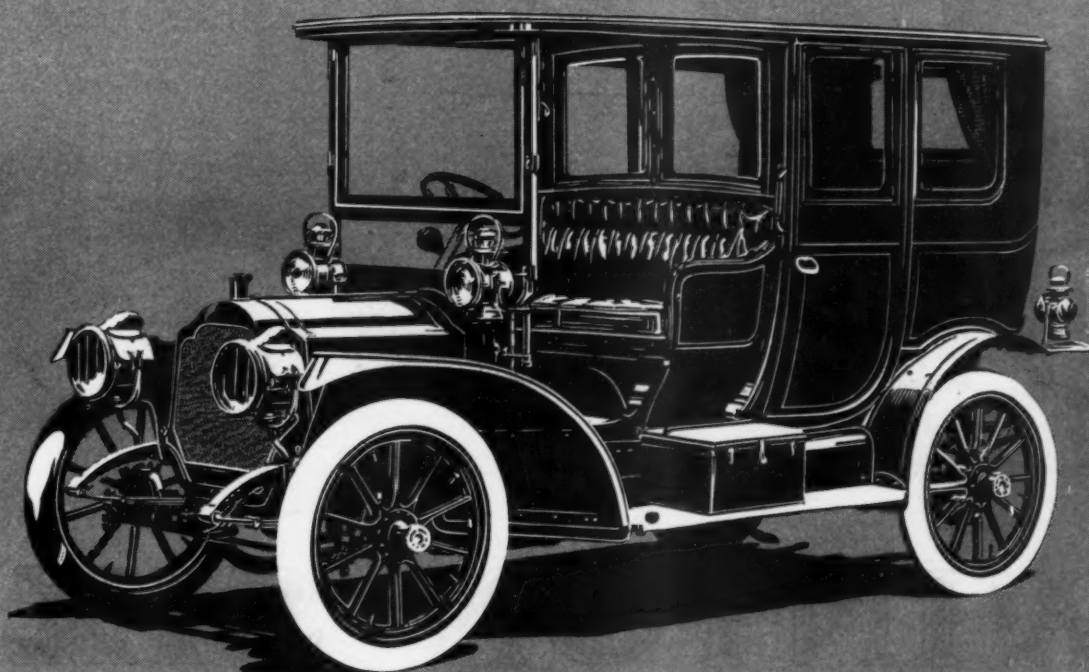
231-241 West 39th Street

New York City

Packard

"EIGHTEEN" 1909

THE TOWN CAR



As a Limousine
Also supplied as a
landaulet, runabout
and with open body



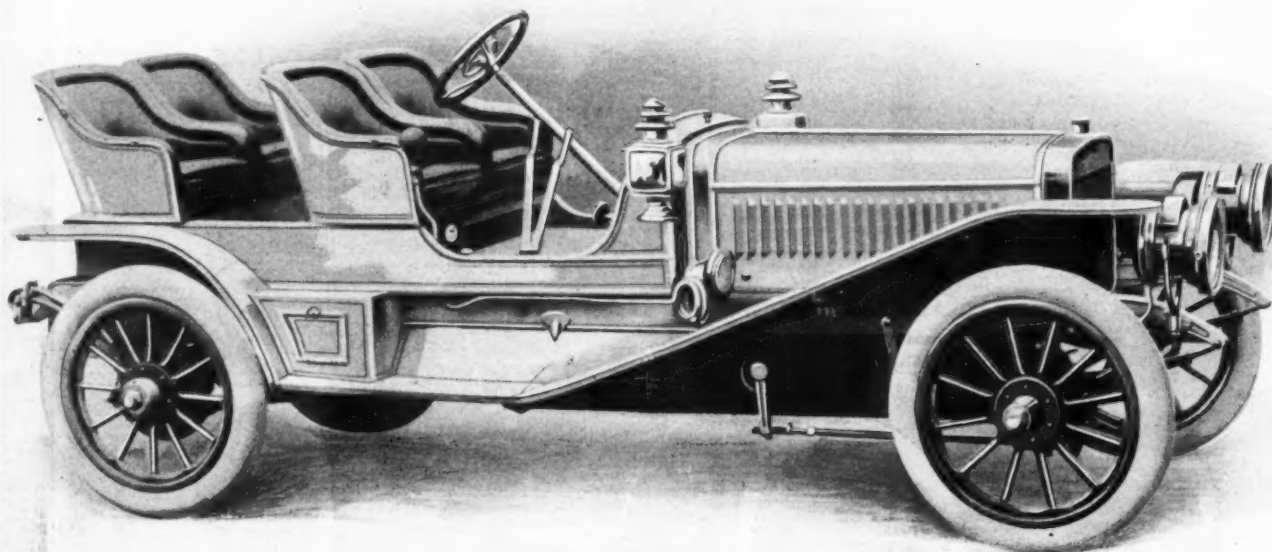
Packard Motor Car Company
Detroit, Michigan

We Make Sixes Exclusively

There are many sixes on the market. And every one of them but ours (so far as we know) is made by a manufacturer who also makes fours. These makers just add two cylinders to a four and call it a six.

Most of them don't care whether you buy a four or a six, because they expect to get you "coming or going." And if you seem to prefer a four, the chance is that they will NOT tell you what a mistake you are making.

We do not ask you to purchase a



WINTON SIX

because we make sixes exclusively. Instead we are making sixes exclusively because sixes are superior to all other types. And we can prove it to you just as we have done to hundreds of others.

The Winton Six isn't a four with two added cylinders. It is a Six from the drafting room to the shipping department, from the radiator to the tail lamp. And because it is a real Six (not a makeshift) the Winton Six proves in its work all the points of superiority we claim for it.

The Winton Six starts without cranking.

Runs as sweetly and as quietly as a watch.

Makes hill climbing simple and easy.

Minimizes gear-shifting, eliminates motor vibration, and goes the route like coasting down hill.

This car holds the world's upkeep record of 4343 miles on One Dollar expense. We send the sworn records upon request.

We shall be pleased to send descriptive literature which fully presents the advantages enjoyed by the Winton Six owner. Our book, "Twelve Rules to Help Buyers," applies to all cars and will aid you in making a safe purchase. Write for literature to-day.

THE WINTON MOTOR CARRIAGE CO.

Member of Association Licensed Automobile Manufacturers

919 Berea Road, CLEVELAND, OHIO, U. S. A.

Winton Branch Houses in New York, Boston, Philadelphia, Baltimore, Pittsburg, Detroit, Chicago, Minneapolis, Seattle and San Francisco
Winton agencies in all important places.

SEE OUR EXHIBIT AT MADISON SQUARE GARDEN SHOW, NEW YORK, JANUARY 16-23

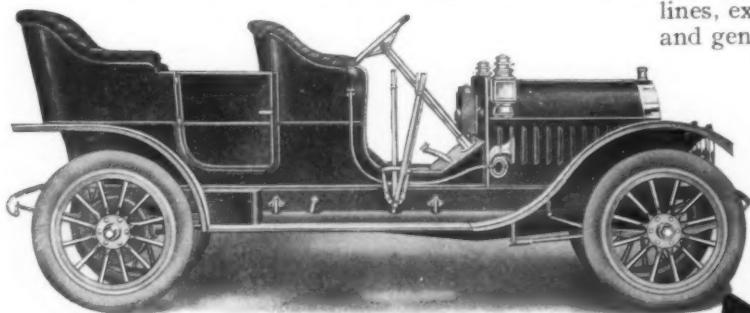
Atlas

TWO CYCLE
MOTOR CARS

The Atlas 3-cylinder Touring Car is equipped with the Atlas two cycle simple, flexible, efficient, indestructible engine. The 3-cylinder two cycle Atlas engine has the light multiple impulses of the six cylinder, four cycle type without any of its complications or rapid deterioration. The numerous poppet valves, valve-shafts, adjustable bearings, cams, springs and dozens of other small breakable, wearable parts are completely eliminated in the Atlas.

THE ENGINE IS PRACTICALLY INDESTRUCTIBLE

The 1909 Touring Car has pressed steel frame, 110" wheel base, geared pump, geared oiler and geared fan, Atwater Kent ignition, $\frac{3}{4}$ elliptic rear springs, 34x4" tires, aluminum body, handsome lines, extreme ease of riding, full equipment of lamps and generator or tank; price \$2,000.



The 1909 line;

2-Cylinder Runabouts	Town Car
3-Cylinder Runabouts	Taxicab
3-Cylinder Touring Car	Delivery Wagon

WILL EXHIBIT AT GRAND CENTRAL PALACE DECEMBER 31st to JANUARY 7th, SPACE 9, SECTION N.

ATLAS MOTOR CAR CO.

94 Birnie Avenue, Springfield, Mass.

New York Office, 1876 Broadway

Send for catalogue and two cycle catechism.

STROMBERG

SIMPLY A PERFECT CARBURETER

Works Best—Lasts Longest and Costs Least.

in the end, for many good reasons, all of which are set forth, described, illustrated and technically explained in Circular No. 1, which we would like to send you.

IT IS
BAD POLICY
TO LET WELL
ENOUGH ALONE
WHEN YOU CAN DO BETTER



At the
Palace
Show.

The Most Elaborate
Carbureter Exhibit
Ever Made. See It.

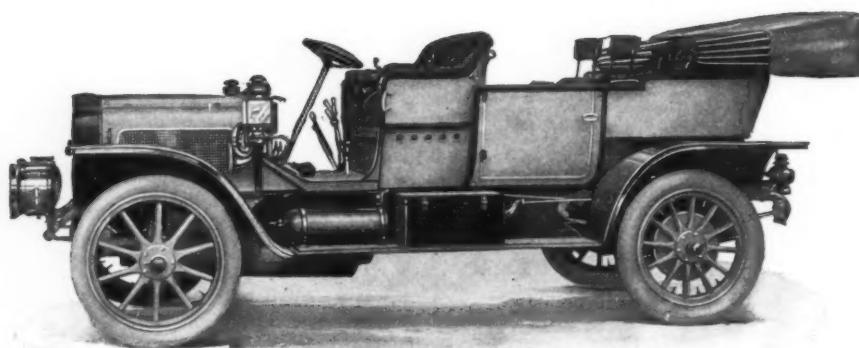
Write for Circular No. 1 TO-DAY

STROMBERG MOTOR DEVICES COMPANY

Main Office and Factory, 1253-1255 Michigan Ave., CHICAGO

EASTERN BRANCH—N. Y. C., 241-2 Thoroughfare Building, B'way and 58th Street, C. S. Gibson, Mgr.
NEW ENGLAND BRANCH—Boston, Massachusetts, 319 Columbus Avenue, E. H. Gross, Mgr.
WESTERN BRANCH—San Francisco, California, 426-8 Van Ness Avenue, Wm. R. Johnson, Mgr.

THE MODEL "M" WHITE STEAMER is the Most Luxurious Car on the Market



The luxury of the White Steamer is unequalled by any other machine. There is no car, however expensive, which has better upholstery, better springs or better finish. Owing to the compactness of the mechanism, the body is much more commodious than in any car of similar wheel-base (122 inches). Few other makes have such a liberal tire equipment (36x4 on the front wheels and 36x5 on the rear wheels).

The luxury of any car, however, depends largely upon its riding qualities, and here the White is "in a class by itself." It is the only car where starting and changes of speed can be effected without jerks or jolts. It is the only car which runs noiselessly under all conditions. It is the only car which is free from vibration, because it is the only car where the power is applied evenly and continuously, and not spasmodically.

Just as our Model "M," priced at \$4,000, is the most desirable of the higher priced cars, so our Model "O," at \$2,000, predominates among moderate priced machines.

Write for descriptive matter.

THE WHITE COMPANY CLEVELAND, OHIO

NEW YORK CITY, Broadway at 62d Street
BOSTON, 320 Newbury Street
PHILADELPHIA, 629-33 North Broad Street
PITTSBURG, 138-148 Beatty Street

CLEVELAND, 407 Rockwell Avenue
CHICAGO, 240 Michigan Avenue
SAN FRANCISCO, Market Street
at Van Ness Avenue
ATLANTA, 120-122 Marietta Street

